

FLIGHT

The
**AIRCRAFT
ENGINEER
&
AIRSHIPS**

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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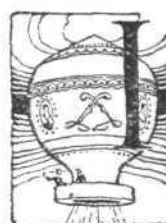
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EDITORIAL COMMENT.



It is too early yet to pronounce an opinion as to whether or not the International Air Congress, which comes to a close on Saturday morning, has been an unqualified success. A perusal of the 60 papers read indicates the magnitude of the undertaking and makes one realise the vast amount of problems which still have to be solved before aviation can take that place which we are firmly convinced it will ultimately occupy in the affairs of the world. As His Royal Highness the Prince of Wales said in his opening address, if there ever was a branch of human knowledge that was essentially international in character it is the science of aeronautics. Consequently it is of the utmost importance that the leading aeronautical experts and scientists of the world should be brought together to discuss common problems and possibly decide upon common ways of attacking them. On the other hand, such a list of papers as that of the present Congress is so extensive that it is well-nigh impossible for anyone to find the time to read and digest thoroughly the valuable information contained. The fact that the subjects are subdivided into four groups helps to a certain extent, but, personally, we think it is possible that in the case of future congresses of this nature it would be better to keep down the number of papers to more manageable limits, leaving more time for a thorough discussion of those presented.

After reading through all the papers, studying the subjects, and comparing the different views expressed, one comes to the conclusion that a certain amount—almost inevitable—of repetition and overlapping is bound to take place. This it might be possible to avoid if the number of papers were reduced. We fully realise the difficulties, but nevertheless think that with good will on all sides something might be done.

For instance, before the next conference is held it might be possible for leading scientists and experts of the various countries to communicate with one another, and to narrow down the subjects to be discussed to the smallest useful number, choosing only such as are really vital. We are aware that it would probably be no easy matter to come to an agreement

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

June 25-30	International Air Congress, London
June 30	R.A.F. Aerial Pageant, Hendon
July 13-14	Air Race for King's Cup
July 16	Unveiling of R.A.F. Memorial by H.R.H. The Prince of Wales
July 17	Air League Royal Ball, Albert Hall
July 20	Gothenburg Exhibition
Aug. 1	Entries close from British Competitors for Schneider Cup
Aug. 3-14	Rhön Gliding Competition
Aug. 6	Aerial Derby
Aug. 6-27	French Gliding Competition, near Cherbourg
Aug. 8-12	F.I.A. Conference, Gothenburg.
Sept. 23 ...	Gordon Bennett Balloon Race, Belgium
Sept. 28 ...	Schneider Cup Seaplane Race at Cowes
Oct. 8-13	Light Plane and Glider Competitions, Lympe
Oct. 14	Baumont Cup Race at Istres, France
Dec. 1	Entries close for French Aero Engine Competition

1924

Mar. 1 French Aero Engine Competition.

on this point, but if we might make a suggestion, offered with all deference, subjects a discussion of which would tend to increase the safety of flying should be given preference. Once we can ensure the safety of flying, the rest is, comparatively speaking, easy. Until we can do so, no manner of progress in efficiency, performance, economy and so forth will avail us. Such subjects as controllability at high angles, the reduction of landing speeds, etc., are, it seems to us, the really essential problems, and we could have liked to see them given somewhat greater prominence in this year's Congress than has been the case.

As far as we personally are concerned, although it is obviously impossible for us to publish in full all the papers read, we shall endeavour to give extracts from all such papers as appear to us to contain really new matter, or to throw new light on an old subject. In this way we hope to be of some assistance in bringing to the notice of the many who were unable to attend the Congress the more important matters raised, and at an earlier date than if they had to await the publication of the official proceedings of the Congress.

**The Race
for the
Grosvenor
Cup**

The first air race to be held this year—the competition for the challenge cup presented by Lord Edward Grosvenor—was, unfortunately, marred by the sad accident which resulted in the death of Major Foot, M.C. The exact cause of the accident has not been ascertained at the moment of writing, and although various explanations have been put forward, it is useless to try to speculate on the possible cause. We can but regret that once more the air has taken its toll, and another name added to the long list of those who have given their lives in the cause.

With regard to the race itself, there is not much which calls for comment. Restricted as it was to machines of under 150 h.p., no spectacular performances were expected, and none put up. All the same, the race showed that quite good sport can be provided by machines of low power, although it is to be feared that the general interest in the light 'plane movement—awakened since Lord Edward Grosvenor first

offered his challenge cup—somewhat affected public enthusiasm in Saturday's race.

The winner, Flight-Lieut. Longton, is well known also outside the R.A.F., and has taken part in several competitions in the past. The fact that he won the Grosvenor race will make his "crazy flying" at the Aerial Pageant all the more popular. Raynham is an old favourite, and on Saturday only just missed winning the race, after putting up an extremely good effort. Bert Hinkler, on his little Avro Baby, has a warm place in the public heart ever since his memorable non-stop flight to Turin.

**The
Schneider
Cup**

The timely agitation raised in the House of Commons over the subject of Government support for firms entering for the Schneider Cup Race seems, unfortunately, to be meeting so far with but scant success. Sir Samuel Hoare called attention to the offer by the Air Ministry to purchase the winning machine—minus engine—for £3,000, and regretted his inability—owing to lack of money—to promise further assistance this year. As we remarked in these columns several weeks ago, although the offer of £3,000 for the winning machine shows a willingness to help, it is in no way comparable with the American method of purchasing the machines before the race, nor of the French way of giving large financial assistance to any French competitor completing the course. As Sir Samuel Hoare says there is no more money this year, it might be possible, and advisable, to offer the whole of the £6,000 (i.e., the above £3,000 and the £3,000 promised for the Derby winner) for the winner of the Schneider race, if British. This would be a considerable hardship on those British constructors who are building machines for the Aerial Derby, but it should be remembered that whereas the Derby is not likely to attract foreign competitors, the Schneider Cup Race does do so, and if we should have the ill fortune to lose this year, and the Cup go to America, for instance, the expense next year of sending machines to America would be so great that a Government expenditure of quite considerable magnitude would be necessary to ensure British participation.

THIRTY-FOUR NEW SQUADRONS FOR HOME DEFENCE

ON Tuesday, June 26, the Prime Minister announced in the House of Commons the Government's decision to provide more adequately for the air defence of this country. Outlining British air policy Mr. Baldwin said that the Government had come to the following conclusions with reference to British air power. In addition to meeting the essential air power requirements of the Navy, Army, Indian and Overseas commitments, British air power must include a Home Defence Air Force of sufficient strength adequately to protect us against air attack by the strongest air force within striking distance of this country. It should be organised in part on a regular and permanent military basis, and in part on a territorial or reserve basis, but so arranged as to ensure that sufficient strength would be immediately available for purposes of defence. The fullest possible use was to be made of civilian labour and facilities.

In the first instance the Home Defence Force should consist of fifty-two squadrons, to be created with as little delay as possible, and the Secretary of State for Air had been instructed forthwith to take the preliminary steps for carrying this decision into effect. The result of this proposal would be to add thirty-four squadrons to the authorised strength of the Royal Air Force. The details of the organisation would be arranged with a view to the possibility of subsequent expansion, but before any further development was put in hand the question should be re-examined in the light of the then air strength of foreign Powers.

In conformity with our obligation under the Covenant of the League of Nations, his Majesty's Government would

gladly co-operate with other Governments in limiting the strength of air armaments on lines similar to the Treaty of Washington in the case of the Navy, and any such arrangement would govern the policy of air expansion set out in this statement.

He thought it was only right that the moment a decision had been taken the House should be made acquainted with the fact, but, of course, the details had not been fully worked out. He thought that before long the Secretary of State for Air would be in a position to discuss the matter in detail when the Air Estimates were put down. Later in the year there would also be a Supplementary Estimate for certain expenditure which would have to be incurred in the current year, and then a full discussion would take place.

It would be possible to put down the Air Estimates on any Supply day between now and the end of July.

Sir S. Hoare, Secretary of State for Air, said it was difficult to give an exact estimate of the expenditure, but he thought the expenditure involved this year would not exceed £500,000, and the average expenditure of this extension, including both capital and maintenance, would not be more than £5,500,000. That expenditure would not be reached until probably three years, and in the next year and the year following the expenditure would be considerably less than the full average expenditure of £5,500,000.

These figures were in the nature of a rough estimate, and he would be able to give a more definite and accurate estimate when the Supplementary Estimate came to be considered.

THE R.A.F. AERIAL PAGEANT

A Wonderful Display in Store for Visitors to Hendon

In our issue for June 14 we gave a brief outline of the programme of the R.A.F. Aerial Pageant, which takes place at Hendon on Saturday, and we now give some further details which we think will be of interest.

First and foremost, Their Majesties the King and Queen, the Duke and Duchess of York, the Crown Prince of Sweden, and other members of the Royal Family will witness this year's proceedings. In addition there will, of course, be a large number of notable visitors present—British and International—including the leading members of the military and civil departments of aviation. The British and foreign delegates to the International Air Congress are also attending.

Perhaps greatest interest centres round the various types of machines taking part in the programme, some of which will be seen—by the general public, at all events—for the first time without their "veils of secrecy." Some of the new machines to be "paraded" this year are certainly interesting, and splendid examples of the development of British aircraft design.

Amongst the outstanding machines taking part will be some that have been specially designed for co-operation duties with the Navy. Two of the most important are new ship's fighting aeroplanes designed to ascend from and alight on the decks of aircraft carriers as well as on land aerodromes. These are the Fairey "Flycatcher" and the Parnall "Plover." Both are fitted with 320 h.p. Siddeley "Jaguar" engines, and are small-span land type tractor biplanes. The "Flycatcher" has single "N" interplane struts and the usual Fairey hinged trailing-edge flaps. It has the kinked, or cocked-up, fuselage peculiar to "deck-landing" aircraft. The "Plover" is also a "land" type, with a single pair of interplane struts each side, and its ailerons extend from tip to fuselage on both top and

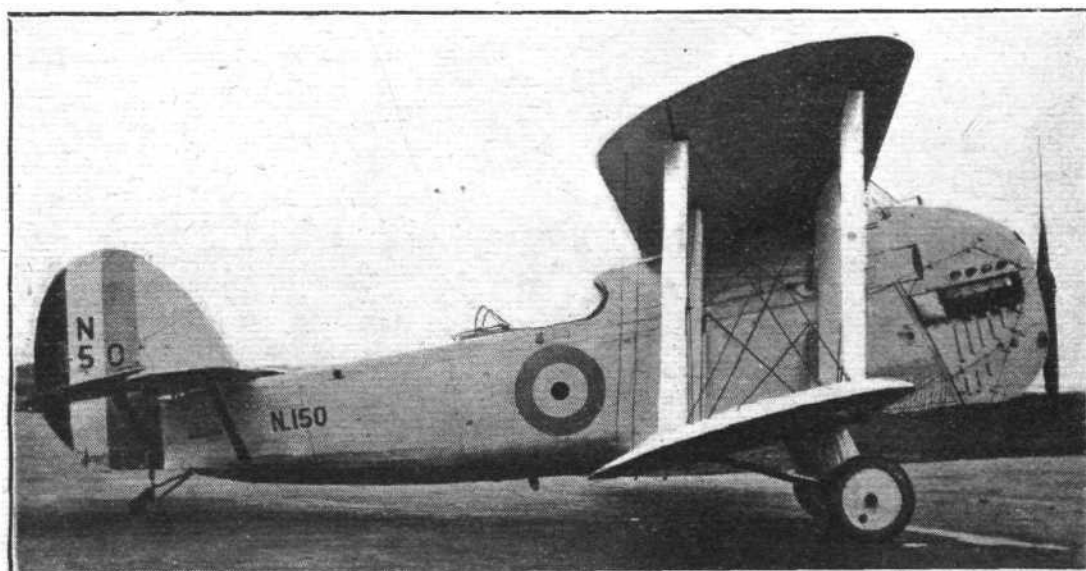
bottom planes. Both machines are capable of high speed at altitudes exceeding 2 miles in height, and possess remarkable manoeuvrability.

Other types of new naval aircraft include the fleet-spotting class and torpedo carriers. The former will be represented by the Avro "Bison" and the Blackburn fleet spotter, which are the latest in this field of design and have qualities of performance of a high order. Torpedo carriers present will be the Blackburn "Dart," with which the naval torpedo-carrier squadrons have been recently equipped, and the Handley Page "Hanley," which is peculiar in having the new "slotted" wing. An interesting machine built for naval reconnaissance duties is the supermarine "Seagull," an amphibian with a fine performance.

The "Blackburn" fleet-spotter is fitted with a 450 h.p. Napier "Lion," and is similar to the Blackburn "Dart" and "Swift" torpedo-carriers, except that the peculiar kink in the fuselage is not so prominent.

Amongst landplanes there are huge new troop-carriers, capable of carrying 25 fully-equipped soldiers, in addition to their crew of two, new single and two-seater fighting machines, long-distance reconnaissance aircraft, bombing machines, and all-metal aeroplanes for various duties. The troop-carriers are the twin-engined Vickers "Victoria," a development of the Vickers "Vernon," now in use in Iraq, and the Armstrong-Siddeley "Awana," a twin-engined all-metal machine. The "Victoria," as may be seen from one of the accompanying illustrations, is similar in general appearance to the well-known Vickers "Vimy Commercial," and is fitted with two Napier "Lion" engines.

Single-seater fighters will include the famous Siddeley-Siskin, which is capable of a speed of about 150 m.p.h. at an altitude of 3 to 4 miles, and the Gloucester "Grebe," the



The Blackburn "Blackburn" Fleet Spotter, 450 h.p. Napier "Lion."



THE BOULTON AND PAUL "BOURGES," (2) 450 H.P. NAPIER "LIONS" : An all-metal long-distance reconnaissance machine.

latest production of the designers of the famous "Bamel," holder of the British speed record.

A new long-distance reconnaissance machine is the Boulton and Paul all-metal twin-engined "Bourges" biplane, previously described in *FLIGHT*, fitted with two Napier "Lions," and possessing an extraordinary degree of manoeuvrability.

Fairey "Fawn," a single-engined tractor biplane of comparatively large span. It is fitted with a Napier "Lion," and has the usual Fairey hinged trailing-edge flap.

All these machines will take part in an official "Fly Past," and some will participate in the other events of the afternoon. One item on the programme not previously mentioned



THE FAIREY "FLYCATCHER," 320 H.P. SIDDELEY "JAGUAR" : A type of ship's fighting plane.

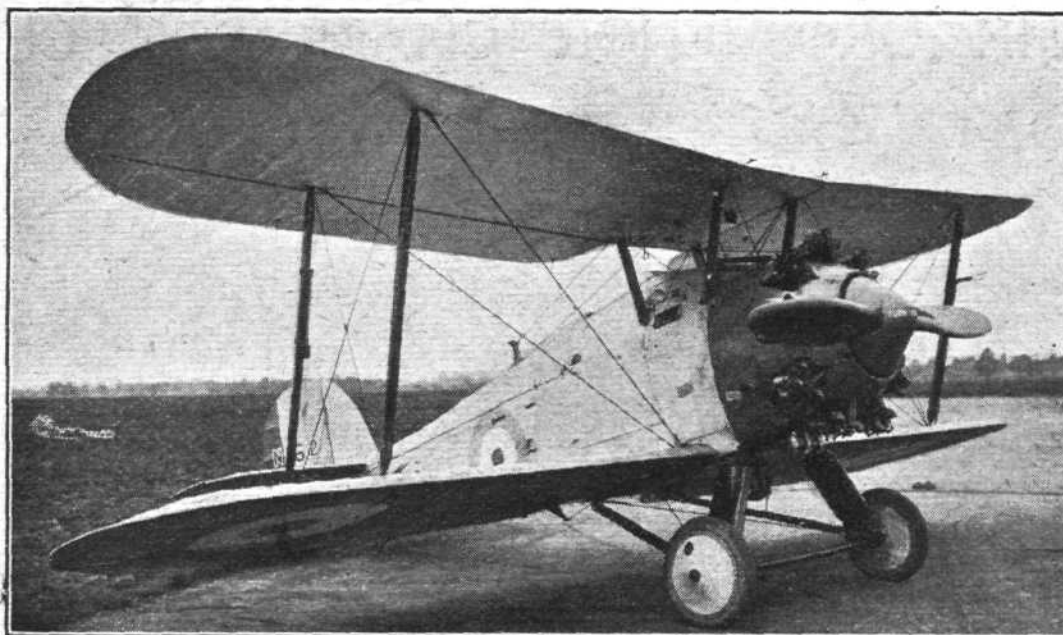
Large bombing aircraft will be represented by the 1,000 h.p. "Avro-Cub-Aldershot," the largest single-engined machine in the world. An interesting, and distinctly amusing, contrast to this latter machine will be the "Wren," with its 3½ h.p. motor-cycle engine!

Another new long-distance reconnaissance machine is the

will be a display of Air Drill by a formation of 10 D.H.9A machines from No. 39 Squadron, which had a great record during the war, and is of especial interest to Londoners in that it was the first squadron formed for the defence of London against air raids during the war—having a score of four Zeppelins and one night-bombing aeroplane to its credit.



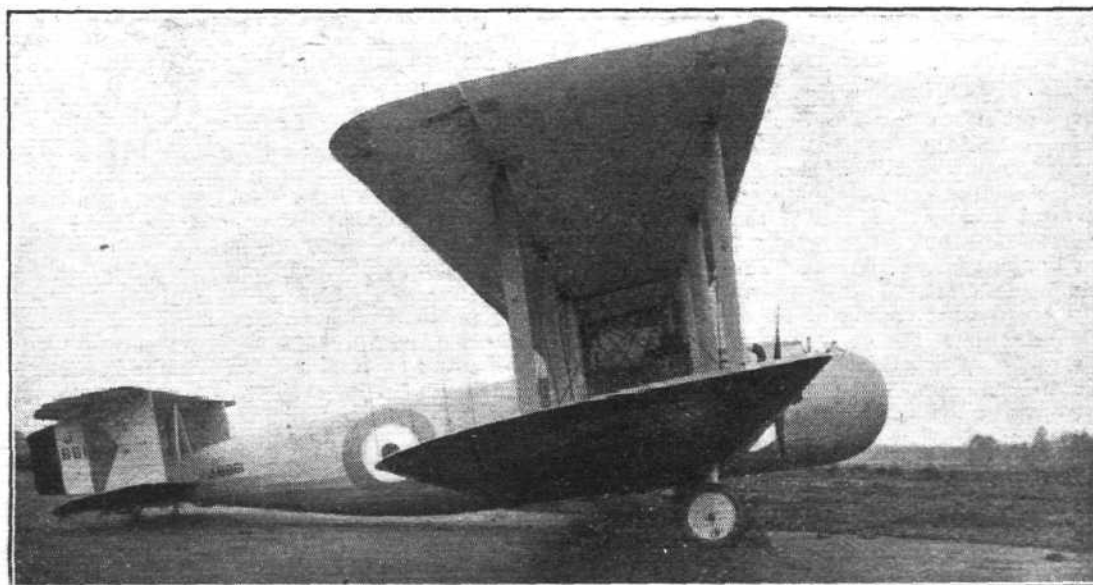
THE FAIREY "FAWN," 450 H.P. NAPIER "LION" : A "land" type long-distance reconnaissance machine.



The Parnall "Plover," 320 h.p. Siddeley "Jaguar": A small fighter, designed to ascend from and alight on the decks of aircraft carriers.

In conclusion, it may be mentioned that the gates at Hendon open at 11 a.m. and flying commences at noon. The main items on the programme will begin at 3 p.m. and continue until 6 o'clock. Special traffic facilities have been arranged in order to cope with an attendance of approximately

be employed at Hendon Aerodrome on Friday and Saturday, June 29 and 30, 1923, in connection with the Aerial Pageant, civil aircraft are warned on those dates against landing at this aerodrome and against flying within the area (shown on a plan appended) unless consent has previously been obtained



The Vickers "Victoria," (2) 450 h.p. Napier "Lions": A large 25-seater troop-carrier—a development of the "Vimy."

100,000 people. Prices of admission are 2s., 5s. and 10s. After the Pageant a Dinner and Ball will be held at the London Country Club, adjoining the Aerodrome.

We would also draw attention to the following Air Ministry Notice to Airmen (No. 45):—

"In view of the large number of Service aircraft which will

in writing from the Secretary, Air Ministry, to whom application should be made.

"Cricklewood and Stag Lane Aerodromes are suitable for the landing of civil aircraft conveying persons by air to the Pageant, the road distances from Hendon Aerodrome being 3½ miles and 1½ miles respectively."



The "Aerial Week-end"

TWENTY French, two English, and two Belgian aeroplanes carried 150 passengers to Berck aerodrome on June 23 in connection with the "aerial week-end" arranged by the Aero Clubs of France, Britain, and Belgium. Sir Samuel Hoare, Lady Maud Hoare, the Duke and Duchess of Sutherland, and several of their friends arrived by Handley Page. The sad accident to Casale cast gloom over the proceedings, and at first it was feared that the accident might have happened when the machine was on its way back from Paris with a party of passengers. The theatrical gala performance and the dance were, of course, cancelled. An aerial golfing com-

petition was part of the programme for the entertainment of the visitors.

Malta-Gibraltar Flight

ACCORDING to a report from Malta, the flying boat Sirius has succeeded in completing, for the first time, the flight from Malta to Gibraltar and back, a distance of 2,020 miles, in a flying time of just over 35 hours. The flying boat Neptune, which came to grief at Bizerta on the return journey, had covered 1,790 miles in 31 hours 19 mins. flying time. The flight was under the command of Group Captain Bigsworth.

THE GROSVENOR CHALLENGE CUP

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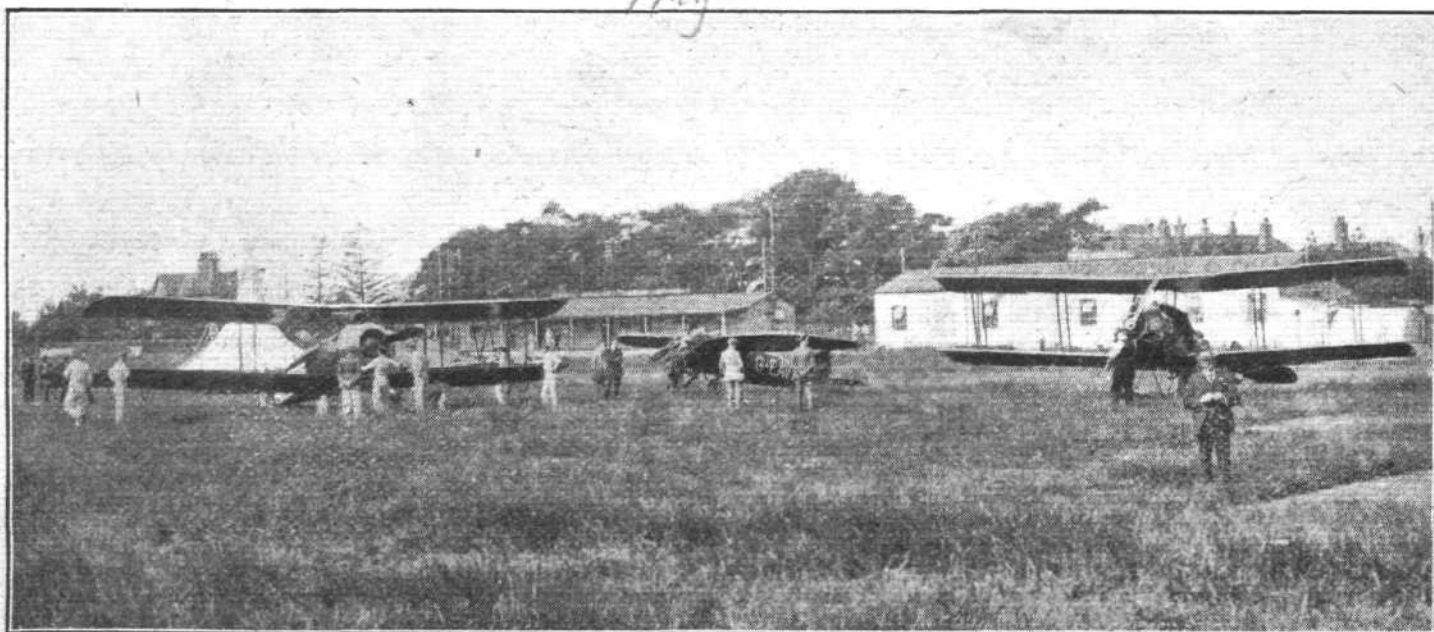
THE GROSVENOR CHALLENGE CUP : On the left, Lord Edward Grosvenor, the donor of the Cup, and on the right, Major-General Sir W. Sefton Brancker—always keeping a watchful eye on Civil Aviation—at Lympne. In the centre is the Cup, a handsome piece of work by the Goldsmiths and Silversmiths Company of Regent Street.

The first air race of the season—the Grosvenor Challenge Cup Point-to-Point Handicap for British-built aeroplanes of not more than 150 h.p.—started last Saturday under ideal conditions, but was unfortunately marred towards the conclusion by a fatal accident to one of the competitors, Major E. L. Foot, M.C., who crashed near Chertsey after leaving Bristol on the homeward journey. Further reference to this regrettable incident will be made later.

The race was flown over a course of approximately 404 miles, starting from Lympne, thence to Croydon (55 miles), Birmingham (106 miles), Bristol (85 miles), Croydon (103 miles), and back to Lympne. Competitors made a stop of half-an-hour at each of the controls. The winner of the Cup and £100, presented by Lord Edward Grosvenor, was

Flight-Lieut. W. H. Longton on a Sopwith "Gnu" (110 h.p. Le Rhone), who completed the 404 miles in 4 hrs. 38 mins. 6 secs. The second prize of £50 was won by F. P. Raynham on his Avro 504 *k* (130 h.p. Clerget), and the third man home was Bert Hinkler on the Avro Baby (35 h.p. Green).

Out of ten entries, one—Lieut.-Col. John Barrett-Lennard's Avro 504 *k*, with Stocken up—scratched, and nine started from Lympne. Out of this number five completed the course. Half the entries consisted of Avros, with one exception, of the 504 *k* type. The only new machine in the race was the Bristol "Taxi-plane" with 100 h.p. Bristol "Lucifer" engine. It is a remarkable fact as regards the engines in the race that the 35 h.p. Green in the Avro Baby was the only water-cooled one, all the others being air-cooled,



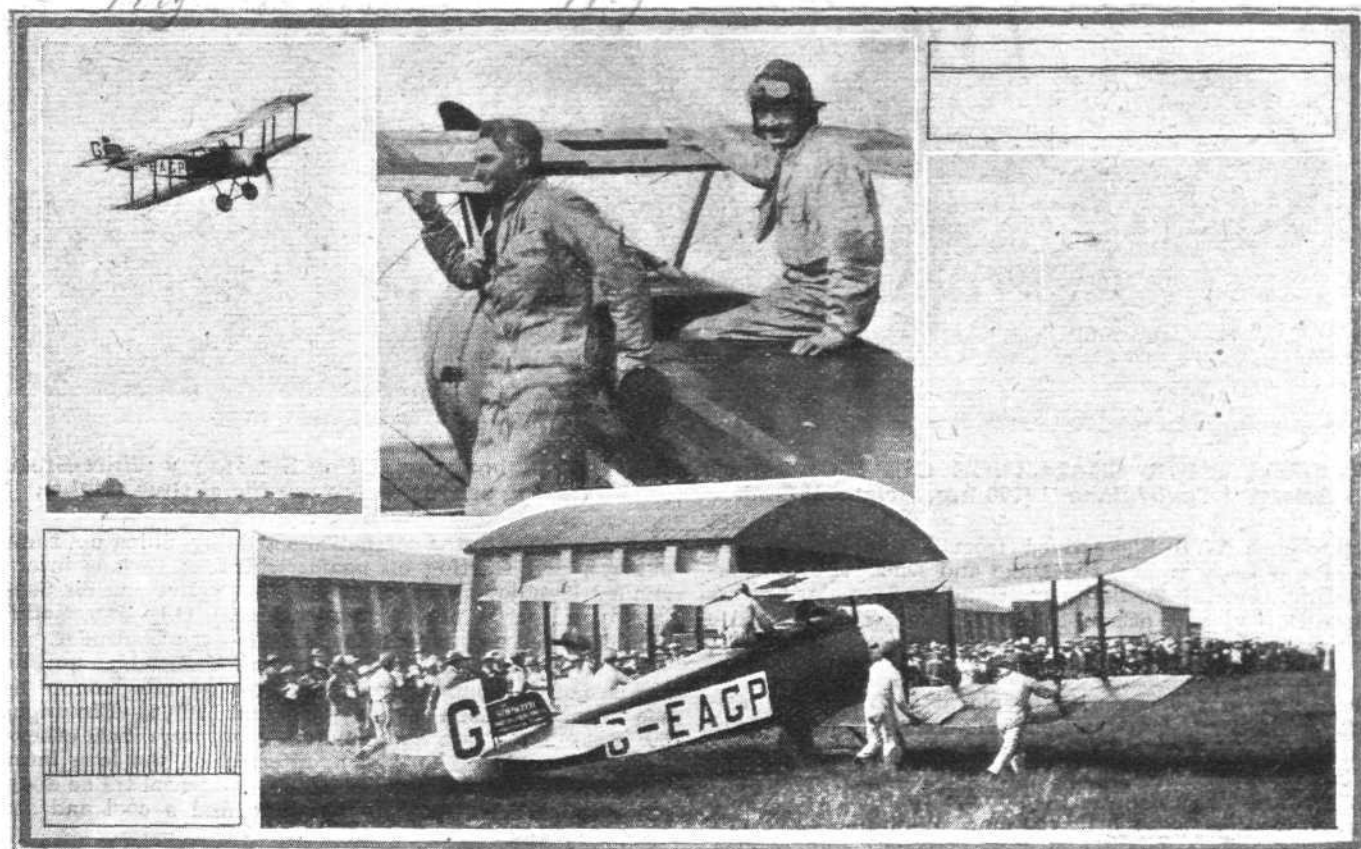
THE GROSVENOR CHALLENGE CUP : Preparing some of the machines before the start at Lympne. From left to right may be seen the Sopwith "Gnu" (Longton), the Bristol monoplane (Foot), and a 504 K Avro (Hamersley).

the Bristol "Lucifer" figuring four times on the list. It is a noteworthy point, also, that the first two machines were fitted with rotary engines.

The Start at Lympne

Weather conditions were ideal at Lympne, and a large number of people visited the aerodrome and watched the proceedings. Maj.-Gen. Sir W. Sefton Brancker—an early

his Avro 504 k (130 h.p. Clerget); H. A. Hamersley, on another Avro 504 k—"Lucifer"; Dr. Whitehead Reid, on his S.E.5a, fitted with an 80 h.p. Renault; F. L. Robinson, on a Boulton and Paul P.9 (90 h.p. R.A.F.); C. F. Uwins, on the Bristol—"Lucifer Taxi-plane"; and, finally, the scratch man, E. L. Foot, on the Bristol "Lucifer" monoplane. It was over an hour and a-half after Hinkler departed before the scratch man was dispatched.

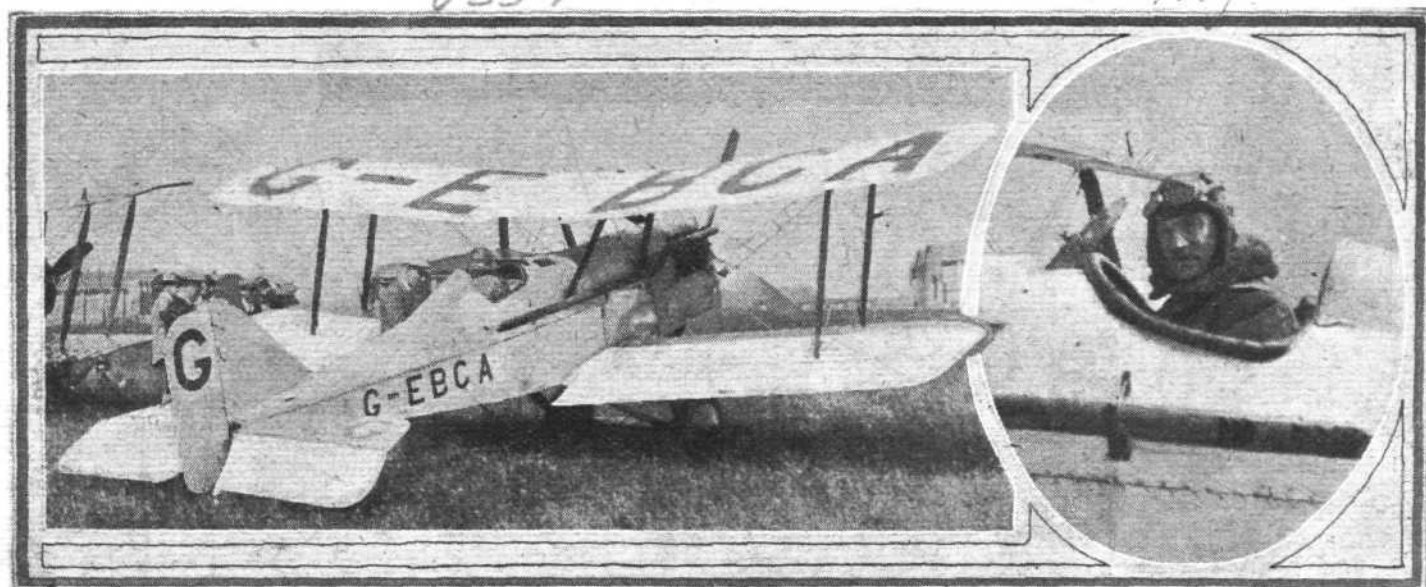


THE GROSVENOR CHALLENGE CUP: On the left, Flight-Lieut. W. H. Longton is seen finishing, and winning the Cup, at Lympne. In the centre, the winner, all smiles, alights from his machine, a Sopwith "Gnu" (110 h.p. Le Rhone). Below, the Sopwith being taxied past the enclosures just as F. P. Raynham, the second man home, arrives (and is seen above) on his Avro (130 h.p. Clerget).

arrival at Lympne—acted as Judge, and Major E. A. Edwards was timekeeper. Sharp on 10 a.m. the first machine, Bert Hinkler's Avro "Baby," was started off. Then, at intervals corresponding to their handicaps the other competitors were sent off in the following order: Longton, on the Sopwith "Gnu" (110 h.p. Le Rhone); H. H. Perry, on the Avro 504 k (100 h.p. Bristol "Lucifer"); F. P. Raynham, on

After all the competitors had gone, the Surrey Flying Services put up a number of passenger flights with their D.H. and Avro machines, whilst considerable interest was aroused by the appearance and flying of the Gnosselius "Gull" light 'plane, fitted with a 5-6 h.p. Blackburn twin motor-cycle engine.

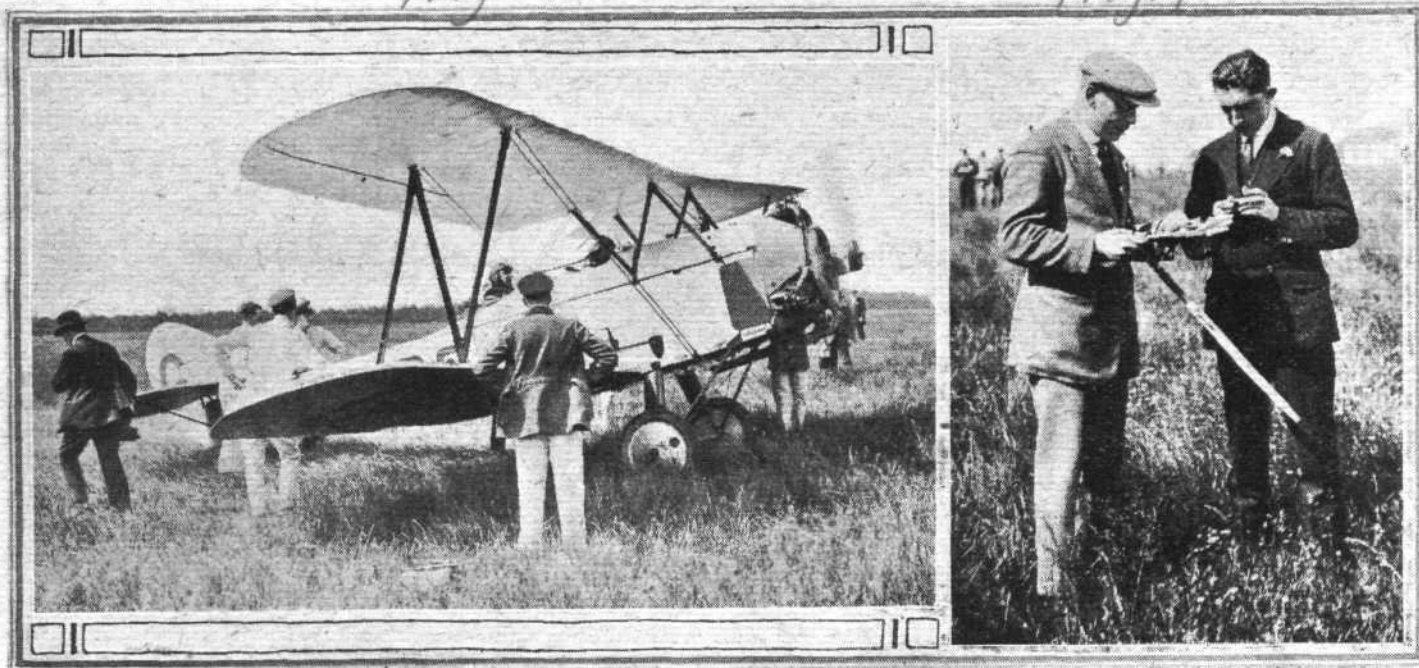
Later in the afternoon, by way of a contrast, one of the



THE GROSVENOR CHALLENGE CUP: Dr. E. D. Whitehead Reid, who flew his own mount, seen on the left, a Renault-engined (80 h.p.) S.E.5a.

Neg.

Neg 4



THE GROSVENOR CHALLENGE CUP : On the left, C. F. Uwins about to start on Sir Henry White-Smith's Bristol "Taxi-plane" (100 h.p. Bristol "Lucifer"), after having set his watch to official time (right).

Handley-Page W. 8 B's arrived from Croydon, with Sir Samuel and Lady Hoare, the Duke and Duchess of Sutherland, Brig-General Festing, Mr. Handley-Page, Mr. Frank Hedges Butler, and others as passengers. They were on their way to Le Touquet, and stopped at Lympne for lunch.

At Croydon

There were not very many people at Croydon when, at 10.44.25, the first man in, Longton, crossed the line with Hinkler half a minute behind. Both made perfect landings, and immediately had their fuel tanks replenished. Six minutes later Perry came along, but it was not until some 20 minutes later that the fourth man, Robinson, came into view. Raynham followed him 4 secs. behind, and 4 mins. later Reed arrived, just as Longton was sent away on the next stage to Birmingham. At 11.20.45 Hamersley came in with Uwins 5 mins. behind him.

In the meantime the 'drome presented a somewhat busy

aspect, what with the competitors arriving, filling up, running engines, and starting off again, whilst at various intervals sundry Handley-Pages (including that conveying Sir Samuel Hoare and party, previously mentioned), D.H. 34's, Goliaths, etc., departed and arrived for and from the Continent.

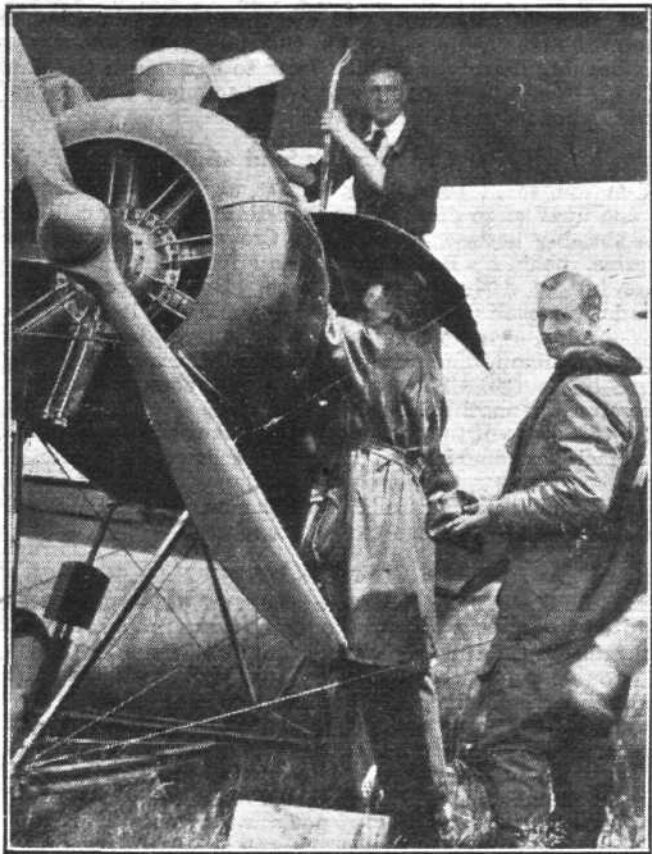
About 5 mins. after Uwins left for Birmingham, Foot, the last of the competitors, arrived on the only monoplane in the race. As soon as he was sent off to Birmingham, 30 mins. later, all and sundry—who were not otherwise engaged—made off for lunch, after which the long interval was spent in watching the London-Continental traffic dodging a joy-riding Avro, and in trying to find a cool and shady vantage point.

At Birmingham

In contrast to last year's King's Cup Race, when Castle Bromwich aerodrome was densely packed with spectators, only a hundred or so were present last Saturday. The



THE GROSVENOR CHALLENGE CUP : A brace of Avros starting from Lympne. Above, A. V. Roe's water-cooled Avro Baby (35 h.p. Green), with Bert Hinkler up, and below, Sir William Letts's "504 K" (100 h.p. air-cooled Bristol "Lucifer"), with Capt. H. A. Hamersley up.



The Grosvenor Cup. In Birmingham Control. F. P. Raynham (on right), who secured second place, with his mechanic busy running over the engine

weather was fine and summery, and there was a fairly stiff westerly wind blowing. The first to arrive, at 12.42.36, was Longton, and Hinkler came along five mins. later—Longton having thus increased his lead considerably. Both reported a somewhat bumpy journey—the little “Baby” naturally feeling it most. Raynham came in third, 10 mins. after Hinkler, having passed Perry on the way. Perry came in just after 1 o'clock with Robinson 2 mins. behind. At 1.10 Uwins arrived, after which Longton and Hinkler were started on their way to Bristol, Hinkler being a little



The Grosvenor Cup. In Birmingham Control. The late Major Foot, M.C., indulging in a cigarette just before leaving. This is probably one of the last photographs ever taken of this greatly-loved pilot

THE GROSVENOR CHALLENGE CUP
Point-to-Point Handicap Race

Order of Start.	Entrant.	Pilot.	Machine.	Engine.	Handicap.	Lympne. Dep.	Croydon. Arr.	Birmingham. Arr.	Bristol. Arr.	Croydon. Arr.	Lympne. Arr.	Net Flying Time.	Position.
1	A. V. Roe	B. Hinkler	Avro "Baby"	35 Green	1 34 20	10 0 0	10 44 55	12 47 9	2 16 24	4 2 51	5 4 47	h. m. s.	3
2	Lieut.-Col. F. K. McClean, A.F.C.	W. H. Longton	Sopwith "Gnu"	110 Le Rhone	1 31 39	10 2 41	10 44 25	12 42 36	2 10 1	3 41 19	4 40 47	5 4 38	1
3	Lieut.-Col. M. O. Darby	H. H. Perry	Avro 504 K	100 Bristol "Lucifer"	1 30 24	10 3 56	10 51 28	1 1 3	2 34 15	4 44 0	5 51 55	5 47 59	5
4	Dr. E. D. Whitehead Reid	E. D. W. Reid	S.E.5 A	80 Renault	1 15 37	10 18 43	11 14 45	1 52 22	Retired	Birmingham	—	—	—
5	Sqd.-Ldr. F. L. Robinson	F. L. Robinson	Boulton-Paul P.9	90 R.A.F.	1 5 26	10 28 54	11 10 40	1 3 4	Retired	—	—	—	—
6	F. P. Raynham	F. P. Raynham	Avro 504 K	130 Clerget	1 1 11	10 33 9	11 10 50	12 57 3	2 17 20	3 43 25	4 44 38	4 11 29	2
7	Sir William Lettis, K.B.E.	H. A. Hamersley	Avro 504 K	100 Bristol "Lucifer"	0 59 23	10 34 57	11 20 45	1 22 12	2 48 41	4 20 53	5 21 5	4 46 8	4
8	Sir Henry White-Smith, C.B.E.	C. F. Uwins	Bristol "Taxi"	100 Bristol "Lucifer"	0 45 37	10 48 43	11 25 48	1 10 6	Retired	—	—	—	—
9	Sir G. Stanley White, Bart.	E. L. Foot	Bristol Mono	100 Bristol "Lucifer"	Scratch	11 34 20	12 4 48	1 36 10	2 49 31	Crashed	Chertsey	—	—

late in getting away. The next in was Hamersley, and Raynham, Perry and Robinson were sent off before the next man, Foot, arrived. The last to arrive was Reid, and as he judged it impossible to get 90 m.p.h. out of a 60 m.p.h. machine, he retired from the race, and later flew straight back via Croydon.

At Bristol

The scenes at Filton aerodrome were very different from those prevailing at the other controls, for it was estimated that some 25,000 people gathered to watch the progress of the race. The Lord Mayor and Lady Mayoress, Sheriff Horace Walker, Colonel Woodcock, M.P., and many other notabilities—including, of course, many associated with the Bristol Aeroplane Co., were amongst those present. Efforts were also made at entertaining the spectators during intervals of waiting for the competitors, and there was not only a musical programme, but Mr. T. W. Campbell gave some splendid exhibition flights.

Longton still maintained his lead and arrived first at Filton at 2.10.1., with Hinkler plodding bravely, after some 6 mins. behind. Raynham had made good progress, and was only 1 min. behind Hinkler, and it was apparent that these three were going to make a fine fight for the finish.

It was not until a quarter of an hour later that the fourth man turned up. This was Perry, and after Longton, Hinkler and Raynham had left for Croydon, Hamersley arrived, with Foot 1 min. behind. Longton and Raynham both got away on time, but Hinkler lost some 15 mins. in starting. It was then reported that Robinson had come down near Tewkesbury, and that Uwins had experienced engine trouble and retired from the race.

According to the report from a correspondent at Bristol when Major Foot landed at Filton, his fuel tank was leaking, and he appeared considerably affected by the escaping fumes of petrol. Mechanics set to work at once in repairing the defect, and Foot did not get away until 9 mins. after time, and shortly after came the news of his fatal accident.

As regards the latter, at the moment of writing the cause of the accident is somewhat obscure, and, as usual, reports vary. It is certain, however, he was last seen flying very low over Fox Hills, the estate of Lieut.-General Sir Edward Hutton, and immediately after the machine crashed into the

Stonehill Road between Chertsey and Chobham. Foot was in all probability instantly killed on the machine crashing, and when the first people arrived on the scene the whole machine was burning fiercely, and all efforts to extinguish the flames failed. Foot's body was found lying amongst the wreckage, terribly burned and disfigured.

At Croydon (second stage)

Longton, still leading, arrived first, at 3.41.19, at Croydon, on the final stage of the race, but Raynham had caught up considerably between Bristol and Croydon, and landed only 2 mins. behind. Raynham's many friends, at this stage, were full of enthusiasm and hope. He had certainly got wonderful results out of his Avro, doing the last 103 miles in 56 mins. Hinkler came in third, but about 20 mins. after Raynham, and after a similar interval Hamersley came in fourth. The only remaining competitor, Perry, arrived after another 20-mins. interval.

At this stage of the race a larger number of people watched the machines come in, and conditions livened up a little. All five competitors got away on the last lap without any incident of note, and it was not until the last man was well away that the news of Foot's crash came through.

The Finish at Lympne

The final stage of the race was soon accomplished, and resulted in an easy win for Longton, for, although Raynham had reduced the time separating them to 2 mins. at Croydon, oil trouble prevented Raynham from going all out. Thus Longton arrived first at Lympne, nearly 4 mins. ahead of Raynham. It was, nevertheless, a very popular win, and Longton came in for a most hearty ovation.

The third man home was Hinkler, 20 mins. later, having thus once again proved that the Hinkler-Baby combination will come through smiling, if not always first.

Hamersley and Perry were fourth and fifth, respectively. The Cup and Prizes were then presented by Miss Beatrice Grosvenor, daughter of Lord Edward Grosvenor.

Later in the evening, Lord Edward Grosvenor entertained the competitors and officials at his house, near the aerodrome.

The times of the competitors, and other particulars, are given in the accompanying table.

LONDON TERMINAL AERODROME

Monday evening, June 25, 1923.

HANDLEY PAGE TRANSPORT have had the busiest week-end of their existence, and both on Saturday and Sunday have been running at full capacity and experimenting in intensive flying at the same time. The fine weather has caused an increase in the ordinary passenger bookings on all lines, and, in addition, Handleys had several special jobs. One of these was to fly the Secretary of State for Air, together with Lady Hoare, the Duke and Duchess of Sutherland, Major-General Sir W. S. Brancker, and others of the Air Ministry Staff, to the aerial week-end at Le Touquet, and this occupied one of their four machines.

Another special trip was a works' outing, arranged for Saturday and Sunday, when two machines were needed to transport twenty-six of the staff of Messrs. Avery to Paris on Saturday, and bring them back to London on Sunday. On top of all this there was the usual increase in traffic for the French Grand Prix, and I understand that on Saturday alone Handley Page Transport carried over eighty people between London and France. On Sunday they appeared to be just as busy, and their machines were arriving and leaving at all sorts of unusual times right up to a late hour.

Increase of Traffic on the Berlin Route

THE Daimler Airway commenced their second weekly service to Berlin on Thursday, when a full load of passengers left at 9.30 a.m. en route for Hamburg and Berlin, the machine returning to London on Friday. This service will in future run every week, and, judging by the number of bookings, a regular daily service would be assured of practically full loads. The London-Amsterdam-Berlin route is, in fact, going surprisingly well, and on many days accommodation cannot be found for all who wish to travel.

During the week one of the "Uncles" from the London Broadcasting Station visited the aerodrome in order to collect material for a wireless talk to the younger generation on "The Home of Aeroplanes." He was greatly impressed by all he saw, and, according to himself, gathered enough material for several "talks." It is felt that this idea of educating the rising generation to air transport should be followed up, and in this connection I understand that the Trust House have sent out invitations, by arrangement with the Air Ministry, to all the Schools over a large area, inviting parties to visit the aerodrome and be shown round.

The Freight Service to Cologne

THE Instone Air Line's freight service between London and Cologne is growing by leaps and bounds. On one day alone nearly two tons of goods were flown between Cologne and London, and their machines are being taxed to the uttermost. Mr. Barnard created a new record during the week by flying from London to Cologne and back in 6½ hours. This is the first time that the same pilot and machine have done the return journey, which is approximately 600 miles. It must be remembered, however, that the Daimler pilots exceed this distance in a single day regularly when flying from London to Berlin.

The fine weather over the week-end attracted considerable crowds to the aerodrome, and the Surrey Flying services had a busy time with their joy-ride machines, especially on Sunday.

The regrettable accident in which Major E. L. Foot lost his life during the race for the Grosvenor Cup has cast a gloom over the entire aerodrome. Wherever he went Major Foot was universally admired, and the aerodrome has suffered a great personal loss by his death.

The Air League Royal Ball

THE Duchess of Marlborough is now the head of the Special Events Committee of the great Royal Ball being organised by the Air League of the British Empire. Two real aeroplanes will be slung on either side of the great organ, and a series of "rendezvous" will be adapted to represent

the great air termini reached by British air lines, such as Cologne, Berlin, Paris, etc. The Duke and Duchess of York will be present, supported by a most distinguished company. The Ball Committee meetings are being held at Hampden House, the home of the Duke of Sutherland, who is President of the Air League.

THE INTERNATIONAL AIR CONGRESS

THE International Air Congress, consisting of approximately 450 delegates, representing seventeen nations, was opened on Monday, June 25, at the Institution of Civil Engineers by the Prince of Wales. Among those on the platform were a number of foreign ambassadors, representatives of the British Air Ministry, British Societies, and British Industry, and representatives of the services dealing with aeronautics in the foreign countries participating in the Congress.

The Prince of Wales, who presided, and who was received with great enthusiasm, said:—

"I am very pleased indeed to come here this morning and open this Conference, and to welcome to London so many leading experts in all branches of aeronautics who are present as Government representatives, as representatives of aero clubs and societies all the world over, and also as private individuals. This is a red-letter day, because it is the first time that the International Air Congress has been held in London, although we possess, I think, the oldest-known aeronautical body in the Royal Aeronautical Society, which has had a continuous existence ever since 1866. We at the present time have been very fortunate in that we have been able to see the achievement of an ambition that has always been to the forefront of human endeavour, and by that I mean the attainment of flight by men.

"We look back into history, and there is hardly any great brain which did not inquire into the possibilities of flight, and one can think of many names, such as Roger Bacon and Leonardo da Vinci, but it has remained for us in this century to see its fulfilment. We all of us in this room know of the great uses of aeronautics in war. We most sincerely hope that we and the generations to come won't ever have to go through that experience again; but there is no doubt that the Great War helped flight out of all proportion. Money at that time was of no consequence, and its growth was very rapid indeed; far more so, probably, than if there had never been a war; but the result of this is that we come to see great possibilities of the air and aeronautics in peace time. That is why we all of us gather together in London to develop it.

"I know that you have a lot of business in hand, and there is only one more thing I would say—if there ever was a branch of human knowledge that was essentially international in character it is the science of aeronautics. The effect of so immensely great, and increasing, speed of locomotion in an element that is independent of the accustomed frontiers of land and water must be very beneficial to the growth of international good feeling. It is for this reason, and because the development of aeronautics, to which all branches of science and engineering contribute, is such a potent force in the advancement of the total sum of human knowledge, that I have much pleasure in declaring open and wishing all possible success to the first International Air Congress held in London."

The Duke of Sutherland, as Chairman of the Main Com-

mittee, welcomed the representatives and delegates, and said that we were on the eve of far-reaching advances in aviation, that might, within the next decade or two, bring about an adjustment of our manner of living and means of transportation. We hoped, he said, that the time had come when the great aerial energies that were expended in the War by all the nations could now be diverted along channels of progress and good will, for the benefit of the whole human race. He believed, too, that civil aviation would, when properly developed, be of immense commercial advantage to all countries. It was to assist in bringing about this great purpose that the Congress had been called, but to achieve their ends it was necessary that all the Governments concerned should give their continued support. The day, His Grace said, had gone by when these things could be left to develop themselves, and the stakes were too great for us to stand negligently by while the world's greatest secrets were almost within our grasp. The development of civil and commercial aviation between all countries on a scale hitherto unrealised, and the evolution of a popular, cheap, light aeroplane for the public use, were both essential factors for the future. The Prince of Wales had referred to our possession of the oldest aeronautical body in the world—the Royal Aeronautical Society. He (the Duke of Sutherland) would like to point out that this country also had the distinction of having held the first aeronautical exhibition, which took place at the Crystal Palace in 1868, at which appeared John Stringfellow's steam-driven model.

His Grace, continuing, said he hoped that a regular series of such congresses would be held in the future. Frank and free discussion of ideas between workers of all nations was the best way to further progress. Science should recognise no distinctions of nationality, but should all work together for the common cause.

Concluding, the Duke of Sutherland said that any resolutions which might be agreed upon would be brought up for general adoption at the concluding meeting on Saturday morning, when the Secretary of State for Air would preside. He believed the labours of the congress would do much to advance us further along the hard road of aeronautical research. They all regretted most deeply the sad accidents to aviators that had occurred from time to time, but these accidents increased the importance of scientific research. The names of these gallant aviators would be added to the roll of honour, and our international motto henceforth must be "Safety first."

In the evening a reception of the delegates and members of the Congress took place at the Hotel Victoria, the guest of honour being Group Captain His Royal Highness the Duke of York, with whom was her Royal Highness the Duchess of York. The Royal guests were received by the Duke and Duchess of Sutherland, supported by Lady Maud Hoare.

PAPERS READ AT THE INTERNATIONAL AIR CONGRESS

IN view of the fact that no less than 60 papers—many of them of considerable length—are being read before the International Air Congress, it is obviously impossible for us to publish in *FLIGHT* all the papers in full, or even any of them *in extenso*. In the present and subsequent issues we shall, however, endeavour to publish such extracts as appear to us to deal with new matter, or with subjects not already widely known, but demanding immediate attention. In doing so we feel that we cannot hope altogether to escape omitting things which, in the view of some, should have been included, nor can we expect to do full justice to the various authors by quoting certain passages only from papers which must, in many cases, have involved a very great amount of work. We would, therefore, ask the indulgence not only of our readers, but also of the various eminent scientists and engineers whose work we are compelled to quote but briefly. For a full account of the papers and of the discussions we would refer readers to the proceedings of the International Air Congress, which will be published, without any avoidable delay, we hope, after the closing of the Congress.

STANDARDISATION OF METHODS OF RESEARCH

By Sir Richard Glazebrook, K.C.B., F.R.S.

THE progress of aeronautics owes much to research; to full scale research as carried out at the R.A.E. and at various stations in other countries,* but specially to research on models carried out in wind tunnels of various designs; for by this means most of the fundamental quantities required in order to predict the behaviour of aircraft can be determined with a considerable degree of accuracy and at a cost far less than would be required if it were always necessary to build and test a complete machine, to say nothing of the risk to the pilot and the difficulty of making the full scale tests. We know now that if due care is taken in making the tests, the results of model and full scale work are very closely in agreement.

* In this connection special reference should be made to the work at Langley Field, so admirably described in Prof. Ames' recent Wilbur Wright Lecture.

But there are various forms of channels. Can we be sure that the results from all of these are comparable? Corrections have to be made to the direct measurements. Do we know these corrections to the accuracy now needed? In passing from model to full-scale there will be a scale effect expressible as a function of vl/v . Can we be sure that this function is a constant at the values of vl at which we are compelled to work? We know that the Lift and Drag can be expressed as $kpV^2Sf(vl/v)$, and in pre-war days much information was obtained of great value on the assumption that $f(vl/v)$ was constant. Is that assumption a safe one to make in view of the higher accuracy now demanded?

Or again, an aeroplane moves in free air; the flow in a channel is straightened and confined by the walls. How does

this affect the results? The effect will certainly be different in the different forms of channel, and intercomparisons are required for their interpretation. Many such questions may be asked. The various forms of tunnel have been described in numerous publications; it will suffice to mention them here:—

(1) The N.P.L. type. A continuous rectangular tube with devices for securing a uniform flow and diffusing the air steadily into the room.

(2) The Eiffel type. This has a long diverging cone at the exit of the working part of the tunnel, in which the velocity of the air falls gradually as the fan or blower is approached and the air is discharged into the room at a lower speed than in the N.P.L. type. Thus the power required to produce a given speed in the working section is much less. The inlet and outlet cones are attached to a central chamber of much greater section than the tunnel itself. In this chamber, which can be made airtight, the measurements are effected.

(3) The R.A.E. type. The working section resembles that of the N.P.L., but the short expansion cone is replaced by a long diverging cone similar to that of the Eiffel type. The room in which the channel is placed is separated into two sections by a honeycomb wall which acts as a diffuser. Experiments at the N.P.L. on a model of a large channel had shown this to be practicable.

(4) The Göttingen type. This is a so-called "racecourse" tunnel. The air is never discharged into the room, but circulates round, making four right-angle bends in each circuit. By the use of curved blades at the corners, a distribution of flow has been secured which is practically uniform over the working section.

(5) To these must now be added the compressed air channel at Langley Field described by Prof. Ames.

Thus, some three years since, Air-Commodore Brooke Popham, then Director of Research, wrote to the Advisory Committee of Aeronautics:—

"It has been suggested that it would be desirable for comparative trials of exactly similar models to be carried out in representative wind channels in England, France, and America, the object being to ascertain from the comparison of the results whether the method of carrying out aerodynamic research in these countries are identical, and whether any improvements in method could be made. I shall be glad of the opinion of the Advisory Committee on this matter, and if they agree that it is desirable, for suggestions as to the nature of the model and of the exact tests which should be carried out."

At the time the Advisory Committee for Aeronautics was in process of becoming the Aeronautical Research Committee, and the new body took the matter into consideration at an early meeting. The suggestion was approved, and the following proposals for tests were made:—

(1) Determination of lift, drag, and centre of pressure of a standard aerofoil at various angles of incidence.

(2) Tests of a complete model aeroplane, including the complete determination of forces and moments, and of the more important stability derivatives.

(3) Resistance measurement at zero angle of yaw of a very good streamline airship model.

Letters were written, asking for an expression of opinion on the question, to:—

Colonel Crocco, Instituto Sperimentale Aeronautico, Rome;

M. G. Eiffel, Laboratoire Aerodynamique, Paris;

M. le Directeur, Institute Aerotechnique de l'Universite de Paris, St. Cyr;

Mr. William Knight, Paris, at that time representing in Europe the American National Advisory Committee for Aeronautics.

The French and Italian authorities replied, approving the proposed plan and making certain valuable suggestions as to the form of the models, the material to be employed in their construction, etc.

M. Toussaint (St. Cyr) added a note suggesting a definition of the conditions of turbulence during the test.

Mr. Knight acknowledged the letter, and stated that it was being transmitted to the U.S. Advisory Committee at Washington for their consideration, and in due course a reply was received promising the co-operation of the Committee.

The replies were discussed by the Aerodynamics Sub-Committee, and as the result it was agreed to construct two airship models differing only as to the length of the parallel portion of the body, and to postpone the construction of the complete model; this item has since been allowed to lapse, partly because of the difficulty of transporting the delicate model, partly because the main object of the enquiry—the intercomparison of the results obtained in different channels,

and the determination of the corrections involved—could be achieved better by the use of a simpler model.

For the aerofoil tests it was decided to use a 6 in. by 36 in. R.A.F. 15 aerofoil which had been cut by the Royal Aircraft Establishment while the design of the airship model was put in hand at the N.P.L. Details as to these various proposals were sent to the participating laboratories in September, 1920.

Subsequent applications to co-operate were received from the Director of the Rijks-Studiendienst voor de Lucktvaart, Holland, the Associate Air Research Committee of Canada, and the Imperial Navy, Japan.

These requests were in all cases approved; while, though it is fully recognised that from the scientific standpoint the co-operation of the laboratories at Göttingen and Vienna is very desirable, political considerations have up to the present put serious difficulties in the way of arranging this.

The aerofoil tests at the N.P.L., where each of the five channels was utilised as opportunities were found in the intervals of other researches, occupied a year. The duplex channel was not employed. The aerofoil was sent to the R.A.E. in September, 1921, and a report on the British tests was drawn up and presented to the Aeronautical Research Committee in May, 1922. The model was then forwarded to France, and the results from the French Laboratories were received in November, 1922. These results have been compared with the British, and the Secretary of the Research Committee has visited Paris and discussed them with the representatives of the French Laboratories. Beyond stating that the agreement is quite satisfactory, I do not propose to discuss them here, for it has been rightly agreed to reserve public discussion until all the results are to hand and can be treated together. It was intended as the next step to send the model, after careful measurement at the N.P.L., to Rome, but on communicating with the Director of the Instituto Sperimentale Aeronautico, he wrote that they were equipping the laboratory afresh, and asked for delay. The next suggestion was to send the model to Ottawa, in the hope that it might go hence to Washington after the American authorities had completed their tests on the airship models. The Canadian Committee, however, wrote that they were putting up a new channel and could not undertake the tests at once.

A similar reply has been received from Amsterdam, and in consequence arrangements are being made to send it to the United States, and a letter has been addressed to the Japanese Naval Attaché, asking if the Japanese Laboratory could receive it later in the year. It had been hoped to complete the European tests before sending the model overseas.

The two model airships were constructed in the workshop of the Metrology Department of the N.P.L., and were tested in a 7 ft. channel at the Laboratory. On the completion of this they were sent to the R.A.E. and tested in a 4 ft. channel, and on their return, after re-measurement, they were sent to the National Advisory Committee for Aeronautics at Washington.

Information has been received that the tests in the Washington Navy Yard and the McCook field tunnels are finished, and it has been agreed to extend the work by including the channels of the Bureau of Standards and of the Massachusetts Institute for Technology, provided it is possible to have the work completed within three months.

And now I have completed the task I undertook, to give an account of the steps taken to secure a comparison between the results obtained in various wind channels and the methods of research applied in various countries. It is incomplete—of this no one is more fully aware than myself—but the work necessarily proceeds slowly; the results are valueless unless every precaution required for accuracy has been taken. When they have been received and compared, they should prove of great value, and their discussion may well form an important item in the next International Air Conference.

[In an appendix to his paper, Sir Richard Glazebrook described the different types of balances in use in this country. As the ordinary type is already well known to readers of FLIGHT, we omit this section of the appendix, and in the following quote but the part dealing with the comparatively new types of wire suspension.—ED.]

Models supported on Wires: for Measurement of Drag only.—This method was probably first used by Prandtl, of Göttingen, who supported stream-line bodies in the wind tunnel by means of four wires, and transmitted the drag by means of an inclined wire passing through the side of the wind tunnel to a balance outside. The method has also been employed in other laboratories, the drag being sometimes determined by observing the displacement of the model as a pendulum under the wind forces. At the N.P.L. the wire suspension is used, in conjunction with the existing aerodynamic balance, for drag measurement on stream-line bodies such as airship forms. It

was found that though a spindle placed near the centre of length of an airship may introduce interference errors comparable in magnitude with the drag to be determined, yet a thin stream-line spindle placed an inch or so behind the tail of the model produced no appreciable interference effect. The model was accordingly supported on one or, more generally, two wires placed near its centre of gravity, and a small steel spike or "sting" was fixed in the tail of the model, projecting about an inch. This spike pressed against the upper end of a small stream-line spindle held in the chuck of the main balance, and was held in contact with this spindle by a light spring (see Fig. 9). The supporting wire or wires being arranged to lie in a vertical plane perpendicular to the wind direction, the model is free only to move a small distance horizontally, this distance being limited by the stops on the balance. In effect, the suspending wires and the rear spindle form a parallel motion for small displacements, so that the only force which can be transmitted to the balance is the drag. The fact that the model swings as a pendulum renders the moving system very stable, so that the ordinary method of observing the balance is not sufficiently sensitive. It is almost impossible to reduce the stability of the balance sufficiently by adding weights above the point on which it rocks, and this method has the disadvantage of increasing load on the point and so giving rise to greater errors due to friction. Another method of reducing the stability was to place a strut with pointed ends between the vertical lower part of the balance and the supporting casting, and to put this strut in compression by a load hung on the "lift" beam. The stability could be reduced to zero by quite a moderate weight on the lift beam, but a considerable amount of friction was introduced at the points of the strut, which moved through a considerable angle for a small movement of the balance.

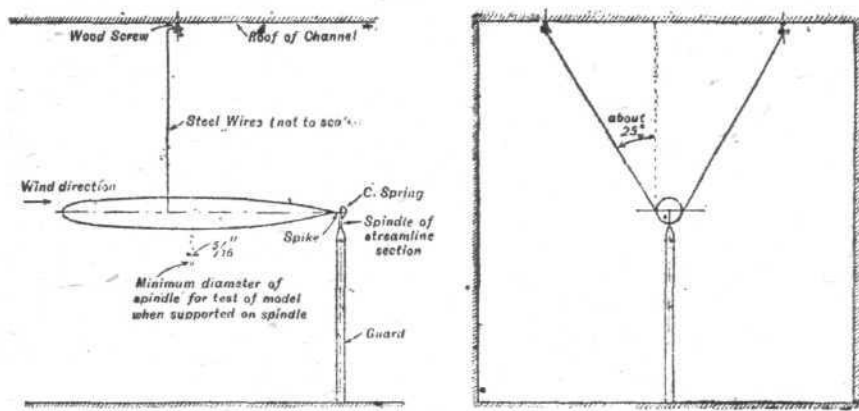


FIG. 9.

The method is eminently suitable when measuring a fairly high drag, such as that of an aeroplane body, but does not make the balance sufficiently sensitive for the accurate measurement of the drag of a good stream-line shape. For this latter purpose the best device was found in the use of a microscope to observe the equilibrium position of the "drag" beam of the balance. It was rather surprising to find that even with a magnification of 100 diameters no stickiness due to friction could be detected if the balance point was in good condition, in spite of the fact that the load upon it was of an order of 80 lbs. The method has been in continuous use, and has been found completely satisfactory, the extra accuracy of observation amply compensating the inconvenience of reading by means of a microscope. It is, of course, necessary to determine the drag of the supporting wires and rear spindle. The latter is easily found by supporting the tail of the model by three fine wires so that the "sting" is just clear of the spindle, and observing the drag of the latter on the balance. The drag of the wires may be found by introducing two extra wires symmetrically placed between the model and the floor of the tunnel, and observing the increase in drag due to their addition. Alternatively, a third supporting wire may be placed between the two main wires, and the drag measured first with the three wires in position and then with the outer pair removed and the model supported solely by the middle vertical wire. The method suffers from the disadvantage that the model is liable to swing sideways when supported on only one wire, especially at high wind speeds.

A further important correction to the drag is rendered necessary by the fact that the static pressure along the centre line of the wind tunnel is not constant. The drag is increased by the quantity $fpdA$, where p is the static pressure and A the cross-sectional area of the model at any point, integration

being taken over the whole length of the model. The variation of p is obtained directly by the use of the static pressure side of the N.P.L. standard pitot tube, readings being taken with the model removed from the tunnel. A simple graphical integration then gives the desired correction. The magnitude of this correction may be as great as 20 per cent. of the drag on an airship model 5 ft. long.

The use of the roof drag balance, to be described later, in place of the ordinary standard balance, has been found to add greatly to the ease of measurement of the drag of stream-line forms. This roof balance is much lighter than the main balance, and it is accordingly easier to obtain the necessary accuracy.

Models supported on Wires for Measurement of Lift, Drag, and Pitching Moment.—While the method of holding an aerofoil by means of a spindle screwed into one end is quite satisfactory for small aerofoils with square ends, it becomes impossible of application when a large aerofoil with thin wing-tips or when a complete aeroplane model is to be tested, on account of the impossibility of obtaining a sufficiently rigid support without introducing large interferences between the spindle and the wings. A development of the "wires" method of support was therefore sought, which would enable lift and drag

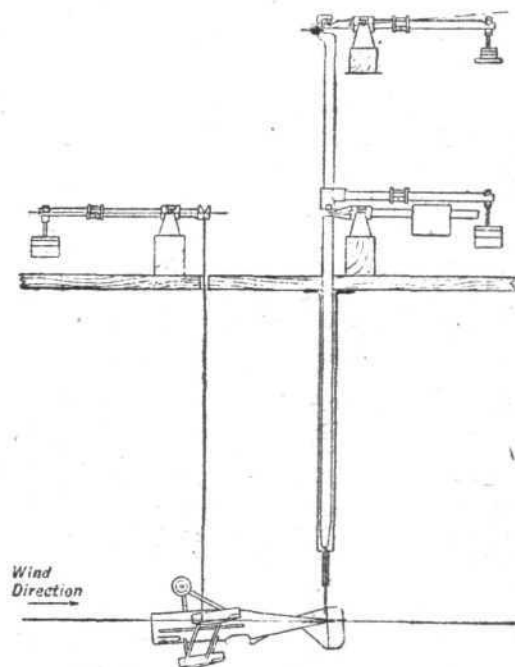


FIG. 10.

measurements to be made on such models. This method, as at present used at the N.P.L., is described below. The model is hung with the wing span horizontal by means of two steel wires attached to the wings about one-third of the chord behind the leading edge, and each about a foot from the plane of symmetry of the model. These wires pass through two small holes in the roof of the tunnel to a balance placed on the roof. This balance is shown diagrammatically in Fig. 10. The wires pass over two pulleys about 4 ft. apart, and thence to a winding drum, attached to the moving part of the balance, by means of which the model can be raised or lowered in the tunnel. The two pulleys are carried on a framework rocking about an axis parallel to the line joining them, and carrying the usual weighing beam, scale pan, and dash-pot. The balance therefore weighs the vertical component of the tension in the supporting wires. The rear end of the fuselage of the model (or a "sting" at the trailing edge in the case of aerofoils tested alone) is carried on a small pin joint attached to the lower end of the second roof balance (see Fig. 10). This balance can be arranged to read either the vertical or horizontal component of the force acting at the pin joint. It consists of a vertical arm extending downwards into the tunnel (protected by a guard), to which is rigidly attached a weighing beam similar to those of the main balance. This vertical arm is supported on a pair of points so that it can only rotate about a horizontal axis perpendicular to the wind direction and a few inches above the tunnel roof. Weights placed on the scale pan thus give a measure of the horizontal force component at the lower end of the balance arm. The device for measuring the vertical component is very similar to that used in the main balance for vertical force. The pair of points mentioned rest in cups carried on one end of a lever at whose other end is a counterbalance, the fulcrum being between the

two. An exactly similar lever, engaging with a point at the upper end of the vertical arm, forms with the first lever a parallel motion, so that when the system moves the vertical arm moves up and down in the direction of its length. A scale pan on the upper lever enables the vertical force to be balanced and measured. When drag is measured, the upper lever of the vertical force device is disengaged, and the lower one rigidly locked, so that the balance is then virtually a bell-crank lever turning on a fixed fulcrum. A simple cam device enables the change from drag to vertical force measurement and *vice versa* to be made instantaneously.

It will be readily seen that if the wires are exactly in a vertical plane, and if there were no deflection of the rear balance due to the drag, the sum of the readings of the main lift and the vertical force at the rear pin joint will be the total lift on the model, while the horizontal component measured on the rear balance will be the drag. As the lift has been measured in two parts, there is also sufficient data for the determination of the pitching moment about any axis. The drag due to the supporting wires and rear spindle is found exactly as described under airship drag on wires, except that the two additional wires are introduced.

The actual procedure is not so simple as described above, on account of the want of absolute verticality of the wires, and the elastic deflection of the rear spindle under the drag load. It is obvious that if the wires are not in a vertical plane the change in their tension due to the lift on the wings will have a horizontal component which will affect the drag balance

The amount of this correction is easily found by hanging a known weight from the main planes in the plane of the wire attachments, and observing the change of zero of the drag balance. The appropriate drag correction for the known actual lift under given conditions is at once calculable. The effect of the slight deflection of the rear spindle under the drag load is mainly to change slightly the inclination of the wires, and so to introduce an error in the drag reading equal to the total tension in the wires multiplied by the sine of the above small change in inclination. This correction can be calculated from a knowledge of the weight of the model, the lift, and the rigidity of the spindle, but a better method is to calibrate the drag balance directly by applying a known horizontal force to the model, and observing the drag reading. This is not strictly correct, as it ignores the effect of lift due to the wind as affecting the total tension in the wires. At moderate wind speeds this lift is of the order of one-fifth of the weight of the model, and as the whole correction is of the order of 1 per cent. it can be neglected. At high wind speeds it is advisable to measure the spindle deflection under given load and calculate the correction. It should here be mentioned that the models are supported upside down in the tunnel, so that the wing lift increases the tension in the wires; with the model right way up, this tension would be decreased by the wing lift, and might result in insufficient lateral stability of the system at high wind speeds, even if the force did not become sufficient to lift the model entirely off the supporting wires.

Major E. L. Foot, M.C.

THE late Major E. L. Foot, M.C., who lost his life in an aeroplane accident during the race for the Grosvenor Cup, joined the Royal Flying Corps in 1915, and became one of our best "stunt" pilots. He served in Scout Squadrons 11th, 60th and 70th on the Western Front with such famous pilots as Ball and Bishop, and was one of the shining lights at the Gosport School of Flying, where the science of stunt flying was developed. After demobilisation Major Foot joined Handley Page Transport, and became one of the best known cross-channel pilots. He remained with that firm until quite recently, when he transferred to the Bristol Aeroplane Company as instructor in connection with the newly-established flying school for the Royal Air Force Reserve.

Major Foot was held in the highest esteem by all who had the good fortune to know him, and his loss will be deeply regretted both in the R.A.F. and in civilian aviation circles. The sympathy of all will go out to Mrs. Foot, who is thus left a widow after but a few months of married life.

The Death of Jean Casale

It is with extreme regret that we have to record this week the death of the famous French pilot Jean Casale. He had taken a party from Paris to Berck, in connection with the "aerial week-end," among which were Monsieur P. E. Flandin and Madame Flandin. On his way back to Paris to pick up another party the machine crashed at Dameraucourt, 6 miles north of Granvilliers, Casale being killed instantly. A mechanic who accompanied him escaped with a shaking, and,

according to his statements, it appears that a control wire either broke or jammed, putting the machine out of control.

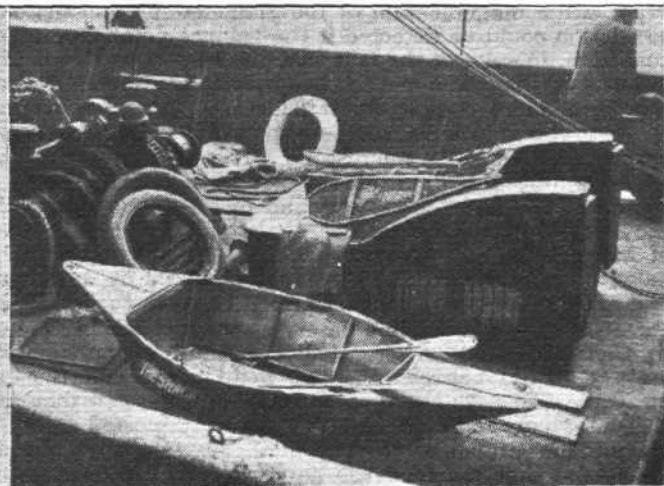
Jean Casale, Marquis de Montferrato, was born on December 24, 1893, in Corsica. He got his pilot's certificate as a private during the War, and brought down 12 enemy machines. He was promoted to Lieutenant and held the Legion of Honour, the Médaille Militaire, and several palms to his Croix de Guerre. Since the War Casale specialised in records, of which he established many, the most recent being the world's altitude record with a load of 1,000 kgs.

R.A.F. Officers and Racing

WE are glad to learn that the Royal Aero Club has received a notification from the Air Ministry that approval has been given for Royal Air Force Officers to compete in aviation race meetings organised by the Club. As we have repeatedly complained of the attitude taken by the authorities on this subject, we are gratified that at last R.A.F. officers will be allowed to take part in meetings. The result cannot fail to have a beneficial effect on sporting aviation.

Scholarships to Overseas Universities

THE Governors of Stowe have received a promise of £1,000 providing 100 gifts of £50 are given towards the founding of Scholarships to the Overseas Universities. Nine friends of Stowe have already promised to give this amount. Readers are invited to support the scheme by sending cheques, crossed "Barclay's Bank," either to the Headmaster at the School or to the Appeal Secretary, 74, Eccleston Square, S.W. 1. Gifts to the Endowment Fund are also welcome.



THE "FRONTIERSMAN" IN ST. CATHERINE'S DOCK: This is the vessel which is to place dumps on various islands in the Northern Pacific for the projected flight by Capt. Macmillan and Malins around the world. On the right, one of the "pneumatic" folding boats (Shackleton type) which the expedition will carry. The snow shoes indicate that work in high northern latitudes is contemplated.

THE SUPERMARINE "SEA EAGLE"

Rolls Royce "Eagle IX" Engine

As believers in and champions of the commercial seaplane, it is with considerable satisfaction that we are able this week to announce that the Supermarine Aviation Works, Ltd., of Southampton, have now completed and tested the first of their modern commercial flying boats, the "Sea Eagle," intended for use on the new Cross-Channel Air Services. The shops at Woolston have always been devoted to the production of seaplanes, and the firm's designers have concentrated on this type for a matter of ten years or more. Persevering, often in spite of scant official encouragement, buoyed up by their belief in the ultimate success of the seaplane, and especially the flying boat, Mr. Scott Paine, Commander Bird, and those associated with them, have resisted the temptation to switch over to aeroplane construction, although to have done so might, and probably would, have resulted in considerable immediate gains. It is an unfortunate fact that so little interest has the Air Ministry of the past had in the flying boat that it has been much easier for a firm to get an aeroplane design accepted than a design for a new type of flying boat. It is, therefore, all the more to the credit of the Supermarine Works that they have retained their faith in the seaplane and, by careful management, have

the commercial seaplane, and we have so often pointed out the advantages of this type of machine that there is no need to repeat the arguments here. Suffice it to say that in the supermarine "Sea Eagle," which has just completed its trials in the air, on land, and on the sea, we have the first modern flying boat specially designed for commercial conditions. The trials have shown the machine to be seaworthy, to handle exceptionally well on the ground (the machine is an amphibian), and to be as good a flying machine as one could wish, regardless of type. The Supermarine Works have turned out some very fine flying boats in the past, and it will be recalled that one of their boats was the first to obtain an airworthiness certificate after the war, while another type won the Schneider Cup last year, but everything goes to show that never have the Woolston Works turned out a boat which combined to such an extent the desirable characteristics of the seaworthy boat hull with the general good behaviour in the air and on the ground, as does the "Sea Eagle."

As the accompanying photographs will show, the new boat differs materially from previous Supermarine flying boats, notably as regards the shape of the bow, which has been designed with a view to enable the machine to plough into a



The Supermarine "Sea Eagle": Three-quarter front view. Note the retractable undercarriage, and the anchor lashed to the side of the boat.

been able to carry-on with their development work on types which offer far greater problems than does any new type of land machine.

Fortunately there are signs that the present Air Ministry is beginning to realise the vast possibilities of the seaplane, but there is still a great deal of reorganisation to be done in the Air Ministry departments before one can be certain that the seaplane will be given the attention it merits. It is no longer a secret that there are precious few, if any, officials left in the technical departments who have special knowledge of seaplanes, and there are instances of technical men with specialist training in seaplane work who are now occupied in departments where their knowledge is of no use to them, nor to the Air Ministry. Knowing this, one can better understand why units working with the Navy have to go to sea on land machines when, according to all common sense, they ought to be equipped with proper seaworthy seaplanes. When fleet spotters are mentioned in these days it appears that the technical experts at the Air Ministry can only think in terms of land machines. Yet it would appear obvious that this function should be performed as a matter of course by seaplanes. However, as already mentioned, there are signs that indicate a realisation in official quarters of the absurdity of this policy, and consequently we may hope in the future to see the seaplane receive the fair share of development which in the past has been denied it. Incidentally, when this happens there will be less cause for complaint by the Navy of lack of understanding of its particular requirements.

For several years FLIGHT has made itself the champion of

head sea without cutting under and without swamping the hull. At the same time, the fore part of the deck has been raised to form a cabin for the six passengers, who are installed in comfortable seats, and who obtain an excellent view through thick windows capable of withstanding the shock of any spray of water that might be thrown up as the machine is taking off.

It is of interest to note that the cabin roof finishes some little way aft of the extreme stem, and that thus not only are the passengers enabled to obtain a good view straight forward when the machine is flying with its tail well up, but also for picking up moorings the pilot is able to walk forward on the sloping sides of the fin chine, a hand rail being provided for him to hold on to just under the cabin windows. It should be noted that a hefty anchor is provided so as to enable the machine to come to anchor, if necessary, in a locality where there are no mooring buoys. In one of the photographs this anchor, with its rope coiled up, may be seen on the starboard side, just under the coaming around the pilot's cockpit.

A land undercarriage of special design is fitted to the sides of the hull and to the lower wing. The shock-absorbing gear is of the oleo type, and what with the exceptionally wide track and absence of "bucking," the "Sea Eagle" handles extraordinarily well on the ground. In this connection it is of interest to note that the "Sea Eagle" has been entered for the King's Cup Race around Britain. Thus we shall be treated to the rather extraordinary sight of a seagoing flying boat taking part in a land machine competition and travelling for nearly the whole of the course over the land. The result should be that a vast number of people will be brought to

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The Supermarine "Sea Eagle": Side view. Note the steps from the fin chine to the pilot's cockpit, and the "coach roof" cabin top.

realise the immense possibilities of the amphibian machine, which is equally at home in the air, on the sea, and ashore.

The Rolls-Royce "Eagle IX" engine is mounted high in the gap between the planes, and drives a four-bladed pusher airscrew. The installation is similar to that of previous supermarine boats in that the engine is mounted on a separate structure, independent of the wing bracing. A most important innovation has, however, been incorporated in the petrol system, in that in place of the usual tank in the hull and pump feed, the main petrol tank has been mounted on top of the top plane, so that direct gravity feed, with its attendant simplicity and freedom from breakdown, can be used. The fact that the engine is mounted high above and some distance aft of the cabin has resulted in reducing the noise audible in the cabin to a minimum, and as a matter of fact, in the "Sea Eagle" it is possible for the passengers to converse in ordinary tone of voice, without having to shout at one another.

A feature of the machine which should go far towards reassuring nervous passengers is that the wings fold forward. Personally we have never heard of the wings of a machine folding back in the air owing to mechanics forgetting to lock the joints in the front spars, but we know that nervous people have been known to fret and worry over the possibility of the pins coming adrift during flight and so allow the wings to fold back. With the Supermarine system of folding the wings forward this very remote contingency could not occur, as

even without the pins the forces on the wings would hold them back in position.

Later on we hope to be able to give a more detailed description of the supermarine "Sea Eagle," dealing with some of the more interesting constructional features. In the meantime sufficient has, we think, been said to indicate that this machine represents a great step forward in the development of the seaworthy amphibian. We look forward to the forthcoming Cross-Channel Services, and to the practical experience which will then be gained. Should these be successful—and there is no reason, as far as can be seen at present, to doubt that they will be entirely successful—the way will have been paved for the establishment of overseas routes with amphibian flying boats to such places as Holland, Northern Germany, and the Scandinavian countries, not to mention services farther afield to and in the British Colonies and Dominions.

The time is, perhaps, scarcely ripe yet to commence services from the Thames at Westminster, but there does not appear to be any reason why flying boat services from Harwich or Felixstowe should not be inaugurated in the near future. An excellent train service already connects London with Harwich, and at Felixstowe there are sheds, slipways, etc., for the accommodation of machines. Customs facilities, light-houses, etc., are also available already, so that the ground organisation required should be capable of being established at relatively trifling cost, as distinct from land routes with their costly aerodromes, lighthouses, wireless stations, etc.



The Supermarine "Sea Eagle" on the water: Note the wheel raised clear. The main petrol tank is mounted on the top plane.

LIGHT 'PLANE AND GLIDER NOTES

■ QUITE a feature of the entertainment at Lympe on Saturday, while the competing machines were away, was Mr. Parker's flying of the Gnosselius "Gull." Many of the visitors to the aerodrome had never before had an opportunity of seeing this machine, and were naturally highly interested in its performance. The general arrangement drawings of the "Gull" were published in our issue of May 31, 1923, as well as sketches of constructional details, and a description of the main features of the machine. As announced in *FLIGHT* recently, Short Brothers, of Rochester, have now arranged with Major Gnosselius to market the machine, and orders may be placed for machines to be completed in time for the forthcoming light 'plane competition which is to be held at Lympe from October 8 to 13.

THE "Gull" handles extraordinarily well in the air, and seems to fly very strongly. She is certainly fast, considering that the Blackburne engine is of but 700 c.c. capacity, and her climb is very good. It appears, however, that the run required for taking off could be shortened considerably if slightly larger wheels were fitted, as in that case the angle of incidence of the wing would be increased without the belly of the fuselage touching. Similarly, for landing the extra angle would seem to be an advantage. Otherwise the "Gull" seems perfect, and we understand that she is very nice to fly,

penny-a-miler 4-6 h.p. single-seater, 80 m.p.g., 30-60 m.p.h., at, say, £200-250.

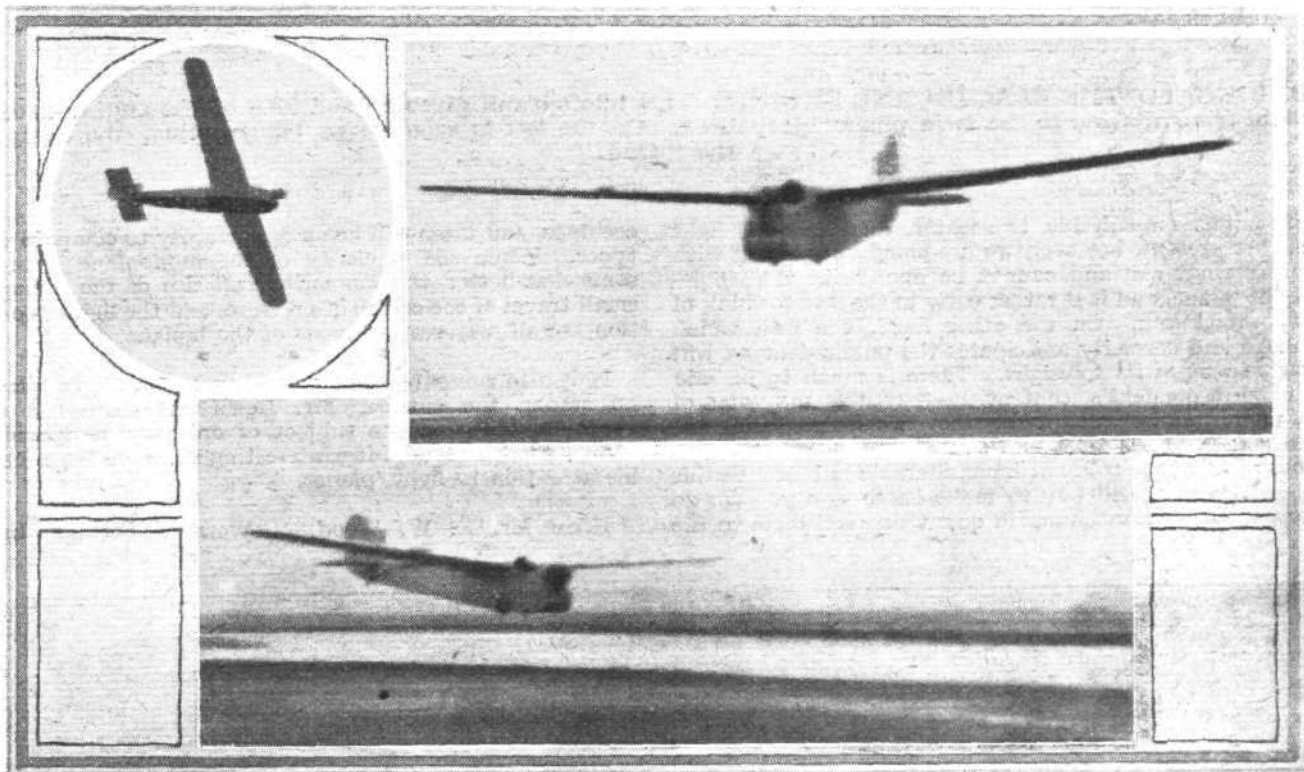
"The public for this is the residue of the war-taught pilots, i.e., those with cash, opportunity, inclination and an absence of too much responsibility.

"If we compute them at 1 per cent. of the 30,000 who could fly at the armistice, we have a public of 300. These are to be shared by, say, six factories producing light 'planes and imports equivalent to another two. That comes to an average of 38 machines per factory before saturation level is reached.

"Any further public must be taught to fly before it can purchase. They will not pay £70 to learn on Mono Avros at 45-85 m.p.h., as the 30-60 m.p.h. 'plane' will be easier to fly, safer and cheaper. The light 'plane instructional 'bus must be evolved. It will have a big surface to keep the landing speed and engine power low, and will therefore probably be a biplane of perhaps 12-14 h.p. (which engine is not designed in this country to public knowledge).

"Three hours dual and 10 hours solo should suffice for most male pupils. We will call the instructional 'bus 2d. a mile or 2d. a minute. Thirteen hours at 2d. a minute is £6 10s. Add overheads, crashes and instructors' time, and call it £15 a ticket.

"They are then fit to fly the penny-a-miler. But will they? No! Most will want the 2d. a mile two-seater. The penny-



Three views of the "Wren" in flight over Lytham sands recently.

has ample controllability, and a fair amount of inherent stability. It is to be hoped that this machine will be entered for the forthcoming experiments at Vauville, near Cherbourg.

■ LAST week we recorded that further flights had been made by Squadron-Leader Wright, on the "Wren," designed by Mr. W. O. Manning, and built by the English Electric Company at their Preston works. We learn from Mr. Manning that the controllability is all that could be desired, and that, at any rate down to speeds as low as 26 m.p.h., the machine is quite controllable. As probably her stalling speed is not very much below this figure, it would appear that nothing much better need be asked. The accompanying photographs show the "Wren" flying over Lytham sands recently.

FROM a gentleman who prefers to be known as "James Robert," writing from a well-known town in Surrey, we have received the following interesting speculation on the future of light 'plane development:—

"We all expect and hope that the coming glider and light 'plane competitions will demonstrate the practicability of the

a-miler will not take a flapper bracket like the solo motor-bike. And even now few people ride solo motor-bikes solo, except poets and jilted swains, and those who were not solo at the last corner. The monocar has a public to be counted on one hand. The designer and trade rider, one. The financial backer, two. The manufacturer-foreman-mechanic, three.

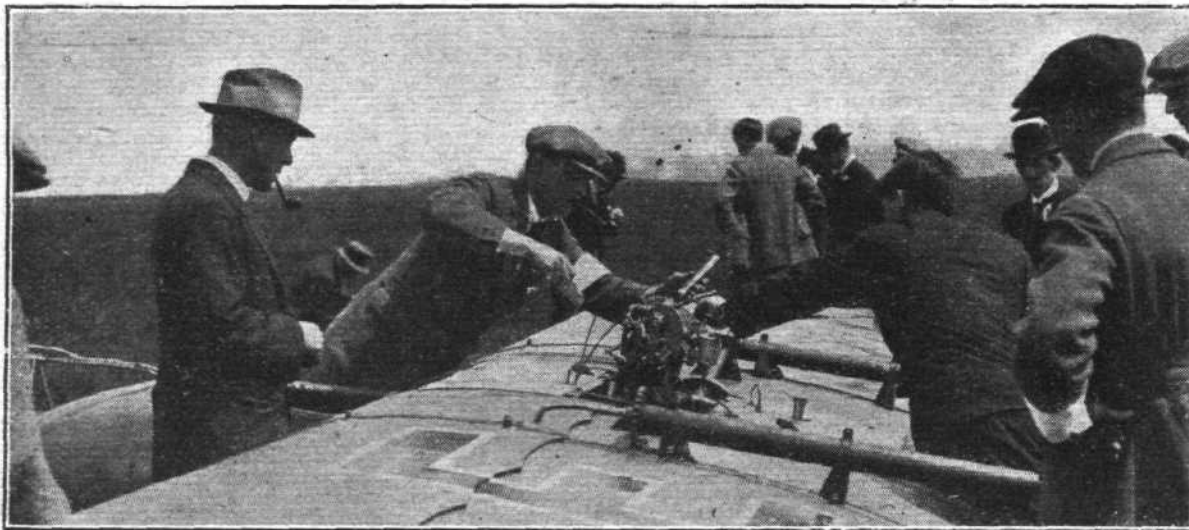
"The 2d.-a-miler must, then, have optional dual control, and be trimmed with or without the passenger. Possibly a central joy-stick, like the American gear lever in their cars, and side by side seating would be the easiest solution. A pusher is pleasanter for joy-riding than a tractor and the out-look is better, so that the 'Gull' arrangement on the upper wing of a biplane might suit. The increased public now able to purchase would allow quantity production, and the price should consequently be no more than the penny-a-miler.

"The organisation of civil joy-riding in light 'planes must strive to copy the yachting clubs, and not attempt to rival the motor-car, which stands in the private garage and is tended by the private chauffeur, who does the mechanically necessary work in an hour a day, and washes, polishes, leathers

and shines for the other seven. One club mechanic could keep half a dozen light 'planes greased, looked over and replenished; and any good local garage could decarbonise or overhaul the engine, which, after all, is only a glorified motor-bike engine."

THERE is a good deal of common sense in this letter, and no doubt the time will come when steps will have to be taken

that there is a very good possibility of a Vickers light 'plane being entered for the Sutherland and *Daily Mail* competitions. Mr. Pierson is at present considering the matter, and we rather think that after going into the subject very carefully he favours the biplane. More than that we are not at liberty to say at present. We are rather glad that all who are contemplating the design of machines for this meeting are not monoplane enthusiasts. In this manner variety will be lent to the pro-



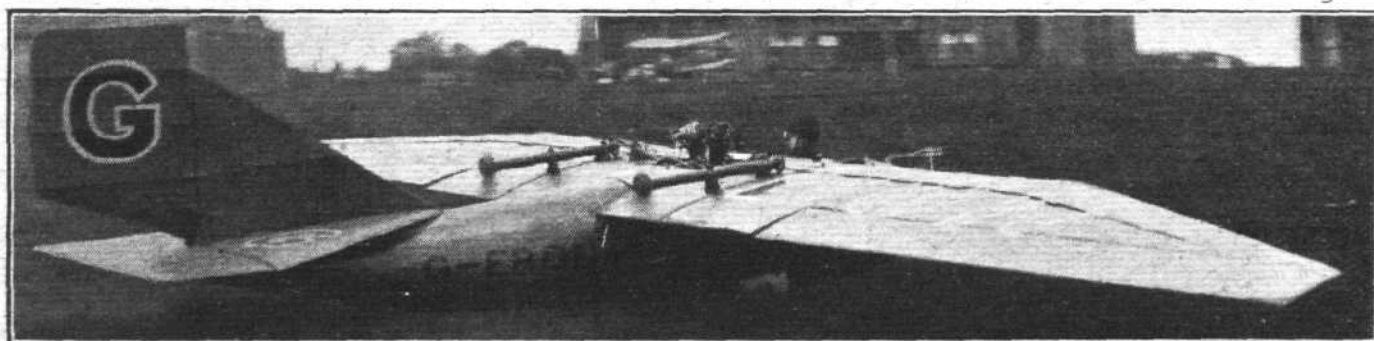
ATTENDING TO THE BLACKBURNE ENGINE : This photograph gives a good idea of the engine mounting and chain transmission to the twin pusher propellers. On the left is seen Major Gnosspeilus, the designer of the "Gull."

to train pupils on suitable two-seater, dual control, light 'planes. At present, however, we are chiefly concerned with discovering what can and cannot be done with the single-seater light 'plane, and it is rather early in the day to think of quantity production. On the other hand, the firm which looks ahead and correctly anticipates the public demand will reap the benefit of its foresight. There is much to be said for our correspondent's contention that the majority of newly-taught pilots will prefer the two-seater, and undoubtedly in a year's time or so it will be possible to sell machines of this type to a not inconsiderable public. In this matter, however, it will pay to make haste slowly. We do not want to produce machines in quantities, sell them to the

ceedings, and there will be an opportunity to compare various types. While the efficiency of the monoplane is probably somewhat better, the smaller overall size of the biplane, the small travel of the centre of pressure, and the lighter construction are all features in favour of the biplane.

It is also rumoured that possibly a Parnall light 'plane will be among the entries. Mr. Bolas has somewhat unconventional ideas on the subject of ordinary aeroplanes, and should produce something interesting if, as we hope, he turns his attention to light 'planes.

FROM Mr. E. W. Wood, of Wensum Cottage, Imperial



THE GNOSPELIUS "GULL" TAKING OFF : The unconcerned attitude of the pilot will be observed, indicating the easy handling of the machine

public, and then find that the average purchaser finds difficulty in handling his machine. A series of accidents of a more or less serious nature would do incalculable damage to the future of this type of machine, and before the "family 'bus" is placed on the market in quantities we shall be wise to make it as "fool-proof" as is humanly possible. If means can be found to prevent stalling and getting into a spin, the largest step forward in the whole history of aviation will have been made, and research into this problem can and should be made with single-seater light 'planes before we begin to "vulgarise" the two-seater.

WE do not think we are divulging a secret when we state

Avenue, Westcliff-on-Sea, we have received the following letter:—

"Referring to your announcement under the 'Light 'Plane and Glider Notes' heading, I may say that I am very keenly interested in all matters relating to gliding and the construction of gliders or light 'planes. I must admit that I have practically no knowledge of aerodynamics, but I have followed aeronautical progress closely since the war and was an interested spectator at Itford last October.

"If any experimenter seeks the assistance of a genuine enthusiast (who will willingly devote all his spare time and is quite prepared even to change his domicile if necessary) I should appreciate a communication from him."

THE ROYAL AIR FORCE

London Gazette, June 19, 1923

General Duties Branch

Flight Cdt. R. H. S. Spaight, having successfully passed through the R.A.F. (Cadet) College, is granted a perm. commn. as a Pilot Offr.; April 21. The following are granted short service commissions as Flying Offrs., with effect from, and with seny. of, the dates indicated:—L. Butler; June 11. E. D. Cummings, A.F.C.; June 7. H. V. David; June 7. O. V. Lee; June 12. C. E. C. Penny; June 6. B. G. Pool; June 11.

Flying Offr. C. H. Harrison is placed on h.p., Scale B; June 9. Pilot Offr. G. T. Underhill resigns his short service commn.; June 20. The short service commn. of Pilot Offr. S. R. Walters is terminated on cessation of duty; June 20. *Gazettes* of dates indicated, concerning following Offrs., are cancelled:—Flying Offr. H. J. T. Russell; April 20. Observer Offr. J. Mitchell, D.S.O., D.F.C.; June 5.

Stores Branch

The following are granted permanent commns. as Flying Officers for accountancy duties, with effect from dates indicated. *Gazettes* of dates indicated in brackets, appointing them to short service commns., are cancelled:—J. F. R. Eales-White; May 10, 1921 (April 25, 1922). O. K. Griffin; March 5, 1921 (April 25, 1922).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

General Duties Branch

Squadron Leaders: C. G. Tucker, to Inland Area Aircraft Depot, Henlow. 1.7.23. R. Leckie, D.S.O., D.S.C., D.F.C., to Headquarters Coastal Area. 5.7.23. G. B. Dacre, D.S.O., to R.A.F. Base, Leuchars. 5.7.23, on completion of Naval Staff Course at R.N. College, Greenwich.

Flying Officers: C. E. Williamson-Jones, D.F.C., to Air Ministry. 18.6.23. C.H. Harrison, to Half Pay List. 9.6.23. F. H. Astle, to R.A.F. Depot (Non-effective Pool). 21.5.23, on transfer to Home Establishment. F. W. Foster, D.F.C., D.S.M., to R.A.F. Base, Leuchars (No. 441 Flight). 21.5.23. E. D. Cummings, D.F.C., to R.A.F. Base, Leuchars. 7.6.23, on appointment to a short service commission. H. V. David, to R.A.F. Depot. 7.6.23, on appointment to a short service commission. H. W. Westaway, to No. 27 Squadron, India. 22.4.23. D. R. Mitchell, M.B.E., to No. 31 Squadron, India. 22.4.23. L. Butler and B. G. Pool, both to R.A.F. Depot. 11.6.23, on appointment to short service commissions. O. V. Lee, to R.A.F. Depot. 12.6.23, on appointment to a short service commission. C. E. C. Penny, to R.A.F. Depot. 6.6.23, on appointment to a short service commission.

The following are transferred to the Reserve, Class B (June 17):—*Flying Officers.*—C. H. Boreham, F. E. C. Finzel, H. Forrest, J. Piggott, F. S. Stokes.

Medical Branch

J. A. Quin, M.D., B.A., is granted a short service commn. as a Flight-Lieut. with effect from, and with seny. of, May 31.

Reserve of Air Force Officers

Class A.—The following are granted commns. on probation in ranks stated in General Duties Branch:—

Flying Officers.—W. E. L. Courtney; April 20. H. A. Francis, A.F.C.; June 11. H. V. Barker, R. C. Berlyn, H. P. Dean, C. Dutton, A. C. Ferguson, D. B. C. Fulton, T. A. Gladstone, A.F.C., M. N. Hancock, C. G. Kitchingman, A. R. Macdonald, C. O. Meeke, A. G. Lamplugh, R. D. de L. Miller, A. D. Pearce, L. Rawlinson, J. W. Richards, E. D. Salthouse, F. W. Webster, W. H. Whitlock, B. S. Wilcox, D.F.C., E. G. H. C. Williams; June 19.

Pilot Officers.—W. F. Jaggs; April 20. A. A. Downs; June 4. C. L. Atkinson, H. C. Biard, G. Burton, R. J. Ewins, G. S. Fenwick, H. W. B. Hansford, T. A. Jackson, A. Lewis, J. Marsh, T. T. Williams, C. L. Wilson; June 19.

Class C.—Flying Officer J. G. Weir, C.M.G., C.B.E., is transferred from Class A to Class C, and is granted rank of Air Commodore; May 18. Flight-Lieut. S. E. Mailer, A.F.C., is transferred from Class A to Class C; June 8.

Pilot Officers: E. C. Keey, to Central Flying School, Upavon. 27.4.23, on appointment to a permanent commission from R.A.F. Cadet College, Cranwell. R. G. A. Vallance, to Central Flying School, Upavon. 7.5.23, on appointment to a permanent commission from R.A.F. Cadet College, Cranwell.

Stores and Accountants Branch

Flying Officers (Stores): J. R. Gardiner. The posting of this officer from No. 2 Flying Training School, Duxford, to Inland Area Aircraft Depot, as previously notified, is hereby cancelled. F. D. D. Gaussen, to Inland Area Aircraft Depot, Henlow. 18.6.23.

Flying Officers (Accountants): H. E. Cardwell, A.F.C., to School of Technical Training (Men), Manston. 15.6.23. B. G. Drake, to Aeroplane Experimental Establishment, Martlesham Heath. 15.6.23.

Pilot Officers (Accountants): F. C. Langley, to R.A.F. Base, Gosport. 15.6.23. E. C. Green, to Armament and Gunnery School, Eastchurch. 15.6.23. F. M. Hall, to R.A.F. Base, Calshot. 15.6.23. J. H. S. Richards, to Marine and Armament Experimental Establishment, Isle of Grain. 15.6.23. R. W. L. Glenn, to Headquarters, Constantinople Wing. 30.5.23.

IN PARLIAMENT

Wind Screens for R.A.F. Machines

LIUT.-COL. SIR P. RICHARDSON on June 21 asked the Secretary of State for Air whether his attention has been drawn to an accident to a Royal Air Force tender at Minster, on June 5, in which the driver was seriously cut by splintered glass; whether he is aware that in the past all Royal Air Force tenders were fitted with unsplinterable glass; and, if so, why this safety precaution is now neglected?

LIUT.-COL. SIR SAMUEL HOARE: The accident referred to is still under investigation, but I understand, from a preliminary report, that two airmen received injuries from the breaking of a wind screen on the occasion in question. As regards the fitting of unsplinterable glass, the use of this was discontinued because of its very high cost and the rarity of the kind of accident which involves injuries, as the result of the splintering of a screen.

Farnborough Railway Line

MR. A. M. SAMUEL asked when it is proposed to take up the full-gauge railway line running over parts of the highway from the airship factory to the South Western goods station at Farnborough, Hants?

SIR S. HOARE: It is not proposed to take up this railway, the continued retention of which is considered essential for the service of the important Royal Aircraft establishment at Farnborough. Negotiations are, however, in progress with the local urban district council in regard to the carrying out of certain alterations which may meet the objections raised by that body.

Schneider Cup

LIUT.-COMMANDER KENWORTHY asked whether any, and, if so, what, assistance, financial or otherwise, His Majesty's Government is giving to British competitors for the international air contest for the Schneider Cup; and what financial assistance is being given by foreign Governments to their respective nationals competing in this contest?

LIUT.-COL. SIR F. HALL asked what are the respective inducements offered by the Governments of Great Britain, America, France, and Italy to entrants in the seaplane competition for the Schneider Cup, which was captured from Italy last year with a Napier-engined British machine?

SIR S. HOARE: As regards foreign countries, I understand that the Govern-

ment of the United States of America contemplate sending three Government-owned aircraft to compete for the Cup. As to the assistance which will be given this year by France and Italy, I am informed that no announcement has yet been made, but I understand that last year the French Government announced its intention to buy any aeroplane built and owned by its nationals which completed the course successfully. As regards this country, a definite step in advance has been taken this year with a view to the encouragement of British aircraft constructors, and it has been decided to offer to purchase for a sum not exceeding £3,000 the aircraft (without engine) which wins the Schneider Cup, provided it is British designed, built, and owned, and is not of a type which has previously won the race.

LIUT.-COMMANDER KENWORTHY: Could not the right hon. Gentleman see his way, at least, to offer the same inducement as the French Government, so that any machine which completes the course successfully should be purchased, or some grant made?

SIR F. HALL: Before the right hon. Gentleman replies, is he aware that the cost of these machines in each case is considerably more than £3,000, and, seeing that this country and Italy have won the Cup twice, will he do his best to increase the offer, so that we may have more competitors from this country?

VISCOUNT CURZON: Does the right hon. Gentleman really think that £3,000 is likely to be sufficient to cover the expenses of any manufacturer who enters his machine under the conditions of the test, and successfully completes the course?

SIR S. HOARE: I regret I have no more money for this purpose this year. The three hon. Members who asked this question should remember that last year no offer to purchase was made, and in spite of that fact a British machine won. This year, I have made a great advance in offering £6,000. I am quite prepared to consider the question again at the end of the year, but at present I am afraid I can hold out no further hope.

SIR F. HALL: Does my right hon. Friend recognise that both the United States and Italy are putting forward extraordinary efforts to get this Cup, and can he not hold out some hope to British manufacturers?

SIR S. HOARE: I am able to reassure my hon. and gallant Friend that, as far as I know, there are going to be British entrants to this race, and I very much hope that they will repeat the success of last year.

THE CENTRAL FLYING SCHOOL PAGEANT

ON Saturday, June 16, an Aerial Pageant was held at the Central Flying School, Upavon. In spite of the unfavourable weather conditions there were about 1,000 people present, amongst whom were the Duke of Sutherland, Air Vice-Marshal Sir Geoffrey Salmond, Sir Godfrey Paine, Air Vice-Marshal J. F. A. Higgins, Air Commodore E. A. D. Masterman, etc. The guests were received by Lady Holt.

Early in the afternoon there was a cricket match against the Machine Gun School—the C.F.S. being the winners. After this, at 5 p.m., the Aerial Display started, the instructors giving an hour and a half of splendid flying. The proceedings opened with formation flying by five Avros, including parachute descents (with dummies). A formation of five Sopwith Snips then attacked the five Avros, and having driven them "off the field," proceeded to give a display of aerobatics.

The next item on the programme was the arrival of a

Mystery Machine from Moscow, piloted by Standbackski, after which was a demonstration of crazy flying on an Avro.

Event No. 5 was a landing competition for Avros, followed by the final event, an "Alarm Race." In this each machine had a team, consisting of one pilot, one observer, one N.C.O., and one aircraftsman. The machines were lined up 50 yards from the starting line. The race started by the crew "manhandling" the machine (machines competed one at a time) to the starting line, putting chocks under the wheels and starting the engine; pilot and observer then took their places and the machine got away and climbed to 500 ft., shut off engine and landed on a mark. The machine completing the performance in the shortest time was the winner.

During the afternoon the Central Band and the C.F.S. Band played selections. It was a very successful meeting, and it is hoped to make it an annual affair.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS (London Aero Models Association)

ATTEMPTS were made on general records on Wimbledon Common on Saturday, 23rd inst. The following flights were timed by Messrs. F. de P. Green and W. Hersom: A. F. Houlberg, 95 secs., 97 secs., 111.8 secs.; H. C. Hersom, 71.4 secs., 84 secs., 87.2 secs.; B. K. Johnson, 55 secs., 57 secs., and 58.4 secs. All these were flying twin pushers.

No attempt could be made on the glider records on Sunday on Parliament Hill on account of weather conditions. A large number of members present spent the time flying models.

The next important event is the Open Competition No. 3 for the Flight Challenge Cup, to be held at Sudbury on the Paddington and District Model Aero Club ground at 4 p.m. on July 7, 1923.

Non-members desirous of further particulars should apply to the Competition Secretary, Mr. C. Bayard Turner, 21, Lanercost Road, Tulse Hill, S.W. 2.

A. E. JONES, Hon. Sec.

SIDE-WINDS

2,100 HOURS in the air sounds a very long time. Yet this is the figure attained by the Rolls-Royce aero-engines fitted in the Handley Page W.8 B aeroplanes on the London-Paris service in the period between October 1, 1922, and May 31, 1923. The figure provides remarkable evidence of the reliability of these engines, and it may be mentioned incidentally that the total mileage achieved by Rolls-Royce aero-engines in civil aviation exclusively has now reached the stupendous figure of 1,225,243 air miles. This figure is compiled from the actual records of engines up to May 31 last.

THE Vacuum Oil Company's lubricating oils have been adding several interesting and important successes to their already very long list. Space does not allow of referring to all of these, but just by way of an indication of the severe tests to which they have been subjected it may be mentioned that on the wonderful 12,000 miles trip made by Cobham recently on a D.H.9, fitted with Siddeley "Puma" engine, Gargoyle Mobiloil "BB" was used throughout the trip, with such complete satisfaction that Cobham wrote a letter of appreciation to the Vacuum Oil Company, Ltd. A facsimile reproduction of this letter appeared in that firm's advertisement in FLIGHT recently, and no doubt interested our readers. The original of the letter may be seen at Caxton House, Westminster.

Of a different kind, but no less trying, was the test imposed on the Gargoyle Mobiloil "B" used by Lieut. Maughan when he established a world's speed record in America by flying at the rate of 236 miles per hour. Again the Gargoyle Mobiloil gave entire satisfaction.

Finally, it is of interest to note that in the Grosvenor Cup Race last Saturday Mr. Bert Hinkler used "BB" for his 35 h.p. Green in the Avro Baby, on which he secured third place.

A. E. JONES, LTD., the well-known House for model aeroplanes and accessories, are removing their works from 25, Evershot Street, to 97, New Oxford Street, London, where all communications should, from now on, be addressed.

Records Homologated

THE Fédération Aéronautique Internationale has just homologated as world's records the following performances: Class D (gliders), altitude (France), 545 m. (1,790 ft.), Adjutant Descamps at Biskra (February 7, 1923), on the Dewoitine.

Class C (heavier-than-air): Greatest speed (U.S.), Lieut. Maughan on Curtiss R.6, 465 h.p. Curtiss, March 29, 1923, 380.751 kms. (236 m.p.h.).

Greatest speed over 500 kms. (U.S.): Lieut. A. Pearson, on Verville-Sperry, 350 h.p. Wright, March 29, 1923, 270 kms. (167.4 m.p.h.).

Greatest speed over 1,000 kms. (U.S.): Lieut. H. R. Harris and R. Lockwood, on D.H.4L, 400 h.p. Liberty, March 29, 1923, 205 kms. (127.2 m.p.h.).

Greatest speed over 1,500 kms. (U.S.): Lieut. H. R. Harris, on D.H.4L, 400 h.p. Liberty, March 29, 1923, 184.03 kms. (114.2 m.p.h.).

Greatest speed over 2,000 kms. (U.S.): Lieut. H. R. Harris, on D.H.4L, 400 h.p. Liberty, April 17, 1923, 183.83 kms. (114 m.p.h.).

Greatest speed over 2,500 kms. (U.S.): Lieuts. Oakley Kelly and J. McReady, on U.S. Army T.2, (Fokker F.L.V), 400 h.p. Liberty, April 16-17, 1923, 115.6 kms. (71.7 m.p.h.).

Greatest speed over 3,000 kms. (U.S.): Lieuts. Oakley

Kelly and McReady, on U.S. Army T.2, 400 Liberty, April 16-17, 1923, 115.27 kms. (71.5 m.p.h.).

Greatest speed over 4,000 kms. (U.S.): Lieuts. Oakley Kelly and McReady, on U.S. Army T.2, 400 Liberty, April 16-17, 1923, 113.39 kms. (113.4 m.p.h.).

Greatest duration without landing (U.S.): Lieuts. Oakley Kelly and McReady, on U.S. Army T.2, 400 Liberty, April 16-17, 1923, 36 hours 4 mins. 34 secs.

Greatest distance without landing (U.S.): Lieuts. Oakley Kelly and McReady, on U.S. Army T.2, 400 Liberty, April 16-17, 1923, 4,050 kms. (2,500 miles).

Entries for the King's Cup Race

ALREADY a good many entries have been received for the race around Britain for the King's Cup on July 13-14, and doubtless several more will be entered before the closing date, June 29. Among the entries already received mention may be made of the following: Sir Wm. Joynson-Hicks, M.P., has entered a Gloucestershire "Grebe," to be piloted by Larry Carter. Sir S. Instone has entered a D.H.4, and Col. F. McClean the Sopwith "Gnu" on which Longton won the Grosvenor Race. Mr. Hubert Scott-Paine has entered the new supermarine "Sea Eagle," described in this issue of FLIGHT. The machine will be piloted by Capt. Biard, winner of the Schneider Cup Race last year. Mr. J. D. Siddeley has entered a Siddeley "Siskin," to be piloted by Mr. Courtney. Mr. Harry Tate has entered a D.H.9 C, to be piloted by Capt. Broad, and the British Prime Minister (of mirth), George Robey, has entered another D.H., to be piloted by Cobham.

Sir Charles Wakefield has presented to the Royal Aero Club a gift of £100, to be allocated at the discretion of the Committee, in connection with the King's Cup Race. Probably the handsome gift will be awarded for particularly meritorious performance in the Race.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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